



Photo by Mélina Blanc

*NORTHWEST INDIANA TREE  
PLANTING CONSORTIUM BEST  
MANAGEMENT PRACTICES  
TOOLKIT*

APRIL 2024

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## *EXECUTIVE SUMMARY*

This Best Management Practices (BMP) toolkit has been crafted to offer comprehensive guidance and tools for Lake County, IN communities aiming to enhance urban tree canopy coverage. Developed with the support of the U.S. Forest Service (USFS) Landscape Scale Restoration (LSR) program, this resource is specifically tailored for members of the Northwest Indiana Tree Planting Consortium (TPC) but can be used by any communities.

The toolkit encompasses a range of Best Management Practices, equipping TPC members with valuable insights and strategies for effective tree planting planning, successful tree planting initiatives, meticulous tree maintenance, and the establishment of Tree City USA ordinances. Additionally, it serves as a valuable resource for setting forestry program goals, fostering a holistic approach to urban forestry.

By utilizing this toolkit, Lake County communities can actively contribute to the realization of co-benefits associated with urban forestry, promoting the overall quality and health of their local tree stock. This resource empowers communities to maximize the positive impact of their urban forestry initiatives, creating more sustainable and resilient environments.

### About Delta Institute

Delta Institute collaborates with communities to solve complex environmental challenges throughout the Midwest. Delta exists because environmental, economic, and climate issues hit communities—urban and rural—through disinvestment, systemic inequity, and policy decisions. We collaborate at the community level to solve our home region’s new and legacy issues, by focusing on the self-defined goals and needs of our partners.

Delta Institute improves the living conditions of more than five million Midwesterners by transitioning one million acres to more resilient, conservation-focused practices, and by improving water quality and reducing flooding by capturing 100 million gallons of stormwater runoff. By 2025 we will achieve these goals through our agriculture, climate, water, and community development projects.

This is what a more resilient, equitable, and innovative Midwest looks like. Visit us online at [www.delta-institute.org](http://www.delta-institute.org).

### Acknowledgements

This project is generously supported by a grant provided by the United States Forest Service Landscape Scale Restoration program. In accordance with Federal law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, disability, and reprisal or retaliation for prior civil rights activity.

Project partners include:

- Davey Resource Group
- Student Conservation Association
- Lake County (Indiana) Parks and Recreation Department

This document and the tools provided aim to be action oriented and to provide the most current, correct, and clear information possible. However, some information may have changed since publication. We encourage practitioners to reach out to us at [delta@delta-institute.org](mailto:delta@delta-institute.org) with questions, corrections, or to discuss implementation challenges.

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# INTRODUCTION

Trees provide many benefits to urban communities and play a crucial role in reducing flooding, improving air and water quality, and climate regulation. Urban forests can(?) intercept thousands of gallons of stormwater annually to prevent polluted surface runoff from overwhelming sewers and entering surrounding ecosystems.<sup>1</sup> Trees also capture airborne pollutants that contribute to ozone and smog,<sup>2</sup> thereby directly improving community health outcomes, especially in underserved communities that experience higher rates of respiratory disease per capita than others.<sup>3</sup> Additionally, trees decrease the severity of urban heat islands, lowering surface temperatures several degrees on average, improving public health and reducing energy bills.<sup>4</sup> Urban forest canopies provide critical habitat to native species and migratory birds, as well as pollinators.<sup>5</sup>

To achieve these numerous positive co-benefits, it is important to promote tree health and longevity by establishing effective processes around what to plant, where to plant, how to maintain plantings, and to implement ongoing best management practices. This *Best Management Practices* (BMP) toolkit provides a meaningful starting point toward helping Lake County, IN communities achieve this goal, by providing them with information to guide their urban tree canopy planning and management.

Developed for the [Northwest Indiana Tree Planting Consortium](#), through support from the U.S. Forest Service (USFS) Landscape Scale Restoration (LSR) program, this BMP toolkit provides Lake County, IN communities with guidance and tools for expanding urban tree canopy coverage, actualizing the co-benefits that arise from urban forestry, and supporting the quality and health of their local tree stock.

Specifically, this BMP toolkit provides guidelines for achieving these outcomes through the following sections and appendices:

## Planting Planning

Tree planting projects start at the planning stage, where communities establish their goals and objectives, evaluate existing conditions, engage stakeholders, and define actions. The Planting Planning section provides guidance on this process, including determining critical factors like planting locations, species distribution, quantities, budget, stock varieties, and forecasted environmental impact.

## Planting Best Practices

Once the planning phase has been completed, planting site logistics must be coordinated. Considering the environmental conditions (like soil type and drainage characteristics), aesthetic considerations (such as visibility and appearance across different seasons), and maintenance needs will help to ensure a planting project simultaneously achieves a high survival rate and accomplishes the project's intended co-benefits (like stormwater management and habitat restoration). This section provides guidance for these considerations and details best practices for tree installation.



## Maintenance Best Practices

To help ensure long-term success of an urban forest, tree maintenance is critical, especially within the first four years of establishment. The Maintenance Best Practices section of this toolkit provides municipalities with guidance around watering, mulching, fertilizing, pruning, staking, protection, and monitoring to support ongoing canopy health.

## Tree City USA Recognition

Tree City USA is a recognized standard for a municipality's commitment to community forestry. As a credential earned and maintained by municipalities across the country (and overseen by the Arbor Day Foundation), the Tree City USA standard is an effective framework for maintaining and growing community canopy cover. While the capacity to meet Tree City USA guidelines varies by community, the Tree City USA Recognition section of this toolkit focuses on the core elements of the standard.

## Forestry Program Goal Setting and Assessment

A key starting point for meeting the Tree City USA standard, and for achieving broader goals around community forestry and urban canopy restoration, is to successfully define a community's intended goals and outcomes; assess its strengths, weaknesses, opportunities, and threats (SWOT); and inventory its budget and operational characteristics, all of which are critical for supporting local tree growth and maintenance. The Forestry Program Goal Setting and Assessment section of this toolkit provides an operations assessment section that allows this Plan to be customized for specific municipalities and agencies, to support ongoing program design and management.

## Appendix I: Tree Species Selection Guide

The Species Selection List for Lake County, Indiana, is a comprehensive compilation of multiple tree nursery inventory lists, which provides practitioners with tree species identified as "approved" or "prohibited" according to the USDA Plant Hardiness Zone Map and other local factors. The user-friendly format of the list enables practitioners to dynamically focus on specific interests. It is important to note that some communities may possess additional characteristics not covered in the list, requiring practitioners to consider additional localized factors during the selection process to ensure the best fit for their community planting planning. This tool empowers users to make informed decisions tailored to the unique needs and characteristics of Lake County's diverse communities.

## Appendix II: Tree Planting Guides

Using best practices when planting trees is essential for ensuring their long-term health, environmental impact, and economic viability. It is an investment in both the present and future well-being of the communities and ecosystems of Lake County, Indiana. Specifically, employing proper planting techniques increases the likelihood of a tree's survival, promotes healthy tree growth and development, maximizes their potential benefits to the environment, lowers the

possibility of premature removal or replacement, and contributes to the beauty and aesthetics of our communities. Practitioners will find in-depth guides for planting three types of tree stock in Appendix II, namely 1) bare root trees, 2) containerized trees and 3) balled and burlapped trees.

## Appendix III: Tree Maintenance Guides

Using best practices when maintaining trees after planting is essential for promoting tree health, enhancing growth, mitigating risks, preserving aesthetics, protecting the environment, and maximizing longevity. A proactive approach to caring for trees ensures their continued contribution to the well-being of ecosystems and communities. Practitioners will find in-depth guides for maintaining trees within three settings in Appendix III: natural areas, landscaped areas, and municipal orchards.

## Appendix IV: Self-Guided Assessment of Forestry Practices

Performing a self-guided assessment of forestry programs represents a proactive approach to continuous improvement and ensures that forestry programs remain responsive to the evolving needs of communities and environments. Conducting a self-assessment allows municipalities to evaluate the effectiveness of their forestry programs, allocate resources more effectively, identify inefficiencies or bottlenecks in program operations, foster greater transparency and collaboration, and enables municipalities to evaluate progress toward sustainability goals related to urban forestry, such as increasing tree canopy cover, improving air quality, and enhancing biodiversity.



A planned restoration site on former agricultural land in Lake County. Photo by Mélina Blanc

## Beyond this Plan

While the intent of this document is to guide communities through the process of planning, planting, maintenance and stewardship for urban canopy growth, it is not a specific planting plan, nor does it provide detailed design guidance. When embarking on these activities, it is recommended that communities work directly with an arborist, forester, or landscape architect, who can provide a detailed canopy and planting plan. These specialists can help identify where canopy gaps are and develop specifications and details that show exactly where to plant what stock, the overall cost, and the maintenance required. The information contained in this plan is intended to assist local governments with a starting point for this process.

## *PLANTING PLANNING*

Developing impactful tree planting projects starts with the planning stage, which involves identifying stakeholder priorities, establishing project goals and objectives, analyzing existing conditions, and defining actions. It is also a critical point to ensure that all stakeholders are provided with meaningful and accessible ways of engaging in the process.

The planning process for the Northwest Indiana Tree Planting Consortium project is an example of the methods described in this section.

### Common Goals & Objectives

There are many reasons for a community to prioritize urban tree canopy planning, restoration, and maintenance; often they connect to achieving higher-level outcomes and goals. While the key drivers of community forestry will differ from community to community, common themes, though non exhaustive, include:

- Reducing flooding and improving water quality
- Increasing shade on public rights-of-way
- Reducing heat island effect
- Increasing biodiversity
- Providing wildlife habitat and food sources
- Reducing erosion
- Reducing wind breaks
- Creating visual screening
- Improving aesthetics
- Increasing property values
- Investing in underserved communities
- Creating more publicly accessible green and natural spaces

The desired benefits that are of greatest importance within a particular community – which are best identified through outreach and engagement with the public – will drive decisions around species selection, planting location, and quantities, for example. After establishing primary goals and objectives, existing conditions can be assessed, which includes data collection, analysis, and stakeholder engagement.

### Data Collection, Analysis & Stakeholder Engagement

To ensure that the planning and implementation of a tree planting project delivers on a community's stated goals and objectives, analyzing existing conditions is a fundamental first step in defining areas of greatest need and opportunity, and where the project can prioritize its efforts. Geospatial analysis using Geographic Information Systems (GIS) software is an especially effective tool for identifying location-specific conditions and prioritizing areas of focus based on those conditions.

To address community goals and objectives, existing conditions around stormwater and canopy cover in Lake County need to be understood. An effective method for achieving this is to create

a geodatabase with the necessary information. A geodatabase can be organized using data from various sources. For this project, a geodatabase has been organized using data from the State of Indiana ([IndianaMap](#)), University of California-Davis ([Soil Properties | California Soil Resource Lab](#)), ESRI ([arcgis.com](#)), and the [Chicago Region Trees Initiative](#). Useful data layers include:

- Political Boundaries
- Canopy Coverage
- Early & Current Land Cover
- Watersheds
- Waterways
- Lakes & Ponds
- Wetlands
- Floodplain
- Protected & Managed Lands
- Drainage Characteristics
- Soil texture, depth, holding capacity, organic matter, pH
- Impervious Surfaces
- Median Family Income (by census tract)
- Percentage of residents below the federal poverty line (by census tract)

Synthesis and analysis of these layers provides a data-driven basis for prioritizing implementation actions within a planting plan.

Communities can further enhance their prioritization of planting by forecasting the environmental impact of a planting project. Using open-source tools like [iTree Planting Calculator](#), users can estimate the impact a project will have on stormwater mitigation, greenhouse gas (GHG) sequestration, air quality, and energy conservation, among other co-benefits. This information will allow each community to choose planting locations and tree species that target specific benefit(s) that may be especially valuable to their objectives.

In addition to geospatial data analysis and modeling, identifying priority planting areas through effective community and stakeholder engagement is a critical step in the process. Input gathered from local stakeholders is necessary to gain a ground-level, community-based lens for guiding how a local unit government prioritizes its resources and improvements. GIS mapping outputs can complement these stakeholder engagement efforts, providing visual representation of data that effectively communicates existing conditions, needs, and opportunities to community members.

Stakeholder input in the planting planning process can be effectively captured through various methods, including but not limited to:

- Community Mapping Workshops
- Planting Site Visits
- Stakeholder Surveys

## Defining Planting Plan Actions

Once existing conditions and priorities have been identified, the project can move toward defining the planting plan's implementation actions, which largely centers on determining the following information, covered in the following sections of this plan:

- Planting locations
- Species distribution
- Quantities
- Stock varieties (e.g., balled and burlapped, container, bare root)

Specific planting recommendations can be geo-coded as points or polygons in the geodatabase and shared with potential contractors at the procurement stage. This helps to estimate implementation costs, streamline project implementation, and track and manage the trees planted throughout their lifetimes.

## Equity and Inclusion Considerations in the Planting Planning Process

To ensure that the planting planning process is both equitable and inclusive of underserved communities, it is recommended that, as a planting project's lead organization executes the process provided in this section, they pay specific attention to:

1. Capturing the priorities and concerns of under-represented stakeholder groups, and
2. Collaboratively identifying solutions and actions with these groups that improve canopy health, reduce flooding, and improve quality of life in their areas.

Geo-spatial analysis plays a key role in identifying specific neighborhoods and community areas where investments in community forestry will benefit low to moderately resourced groups, but this analysis only serves as a starting point. A planting planning project's stakeholder engagement scope serves as the primary phase for educating the public, gathering input on project design, and establishing partnerships around implementation and stewardship.

## Stakeholder Mapping

To ensure an engagement process is equitable and representative of community experience and priorities, it is recommended that the project team begin with a stakeholder mapping exercise to identify existing groups and relevant points of contact. A stakeholder map stands as a database where categories of groups to be engaged are defined by the project team and its partners. These categories, which are not exhaustive, may encompass entities such as neighborhood block clubs, schools, faith-based organizations, and environmental groups. Within these categories, specific organizations and individuals can be identified, offering the project team a foundation for initiating engagement efforts.

It is also important to create additional contextual categories centered around geographic location, primary priorities, and policy stances. These contextual categories lay the future groundwork for using a stakeholder map as a tool for identifying the gaps where additional engagement is needed, to capture diverse views and perspectives. It also serves as the basis

for establishing programmatic partnerships during the implementation stage. A stakeholder map serves as an effective starting point in the identification and engagement process. It can continue to be updated, as the project establishes connections with various groups, serving the overarching goal of reaching under-represented communities. It's important to note that under-represented communities may require additional time or multiple connection points for successful engagement. This practice extends beyond just environmental justice groups and is applicable to the broader community outreach efforts.

## Engagement Planning

With the stakeholder mapping serving as a basis for equitable engagement, the project can execute an engagement process that most closely aligns with the established needs and communication channels for the community's many groups. Whether carried out through in-person workshops, online surveys, or other methods, it is important to design a process that avoids creating barriers towards an inclusive, successful engagement and is respectful of the time and needs of various groups. Common barriers to equitable engagement (and their corresponding solutions) are summarized in Table 1 below.

**Table 1: Common Barriers for Stakeholder Engagement and Possible Solutions**

Category	Common Barriers	Possible Solutions
Physical and Sensory	Meeting locations that are only accessible by car.	<ul style="list-style-type: none"> <li>• Hold meetings at sites that are accessible by transit and non-motorized transportation options.</li> <li>• Provide a virtual meeting option with ADA-compliant accessibility features.</li> </ul>
	Meeting facilities, information, and materials (advertisements, brochures, surveys, etc.) that are only accessible to individuals without physical disabilities.	<ul style="list-style-type: none"> <li>• Hold meetings at sites that satisfy Universal Design Standards, and at a minimum, meet the standards of the Americans with Disabilities Act (ADA).</li> <li>• Provide a virtual meeting option.</li> <li>• Provide meeting information and content that is accessible for individuals with sensory impairments (visual, auditory, etc.)</li> </ul>
Linguistic	Information and materials are only provided in one language.	<ul style="list-style-type: none"> <li>• Provide meeting information and materials in numerous language formats (particular for all that are commonly spoken locally).</li> <li>• Provide translation services at meetings, or host meetings in multiple languages.</li> </ul>

	Presentation of information and materials is overly technical, and inaccessible to the non-expert.	Provide information and materials for different stakeholder groups, with varying levels of expertise and priorities.
Technological	Meeting events that are only hosted using online video conferencing platforms.	Provide in-person and virtual meeting options.
	Information and materials that are only shared using online platforms (website, social media, etc.).	In addition to using digital platforms, distribute materials using traditional print communication methods (mailer, newspaper, etc.)
Temporal	Meetings that are only scheduled at a specific time of day.	<ul style="list-style-type: none"> <li>• Provide varied meeting dates across the week and times of day.</li> <li>• Provide supportive services at the meeting, such as childcare, refreshments, etc.</li> <li>• Record meetings and make them free and publicly accessible online (with project team contact information provided).</li> <li>• Try to partner with meetings already taken place where stakeholders are attending.</li> </ul>
Cultural	The composition of stakeholder groups that are commonly represented at meetings serves to suggest to other groups that they are not as welcome in the engagement process.	<ul style="list-style-type: none"> <li>• Undertake outreach efforts that target attendance and input from commonly under- represented groups.</li> <li>• Work to remove the related barriers that reinforce cultural barriers (physical, linguistic, etc.).</li> </ul>

The barriers and solutions summarized in Table 1 are often interrelated, and depending on the project and the context, the list of barriers that a project team faces will serve to be more specific and perhaps far greater in number. Identification of key barriers in the early stages of a project will serve as a critical step towards ensuring equitable engagement. A project that provides a diverse program of opportunities to engage, and successfully removes its barriers toward engagement, will be most successful at receiving diverse input.

## Turning Input into Action

Beyond the consideration of equitable engagement methods, a critical component of an equitable planning process is that the opportunities for the community to provide input are meaningful and actionable. In a planting planning project, this can include input around specific planting locations and quantities, as well as species selection. The project team should pair the collected input with expertise from an arborist or tree care professional to inform the species and the stock varieties that are selected for plantings.

Effective and equitable engagement during the planning phase establishes ongoing partnerships around community stewardship and future planning projects. Establishing a consistent process of updates throughout a project's implementation phase with previously engaged groups is critical for reinforcing that community priorities were captured and have been incorporated into the project's actions.



## *PLANTING BEST PRACTICES*

In the planting planning process, numerous factors inform decisions around what you want to plant and where, including how a particular tree species contributes to the environment and whether it can succeed in the conditions of a selected planting location.

If stormwater management is a key priority, selection of specific tree species and planting locations is critical to maximize a tree's targeted stormwater benefits, which include reducing runoff velocity and volumes, intercepting rainfall, spurring evapotranspiration, and encouraging infiltration and groundwater recharge. Additionally, proper species selection helps ensure the ongoing health and survival of a project's trees within their identified planting locations. This is particularly important when planting in urban rights-of-way, where trees face a variety of challenges such as frequent flooding, road salt, nearby construction, and constraining parkway dimensions.<sup>7</sup>

Planting trees correctly is crucial for the preservation and growth of Northwest Indiana's urban forest canopies. Regular tree planting is necessary to increase tree canopy cover and replace trees that have been removed due to various reasons like damage, decline, disease, or age. Unlike other urban infrastructure, trees increase in value as they age, providing greater environmental, economic, and societal benefits each year. Employing proper planting practices can significantly improve the survival chances of young trees, as well as minimize potential safety risks associated with improperly planted trees. Tree planting should follow the American National Standards Institute A300 Part 6 standards<sup>8</sup>, the tree planting detail (Figure 9), and the specifications provided below.

### Planning for Tree Planting

#### Model Information and Parts Diagrams

Please find the following diagrams of deciduous (Figure 1) and evergreen (Figure 2) trees below to familiarize yourself with relevant terminology.

## Deciduous Model (loses leaves in the autumn)

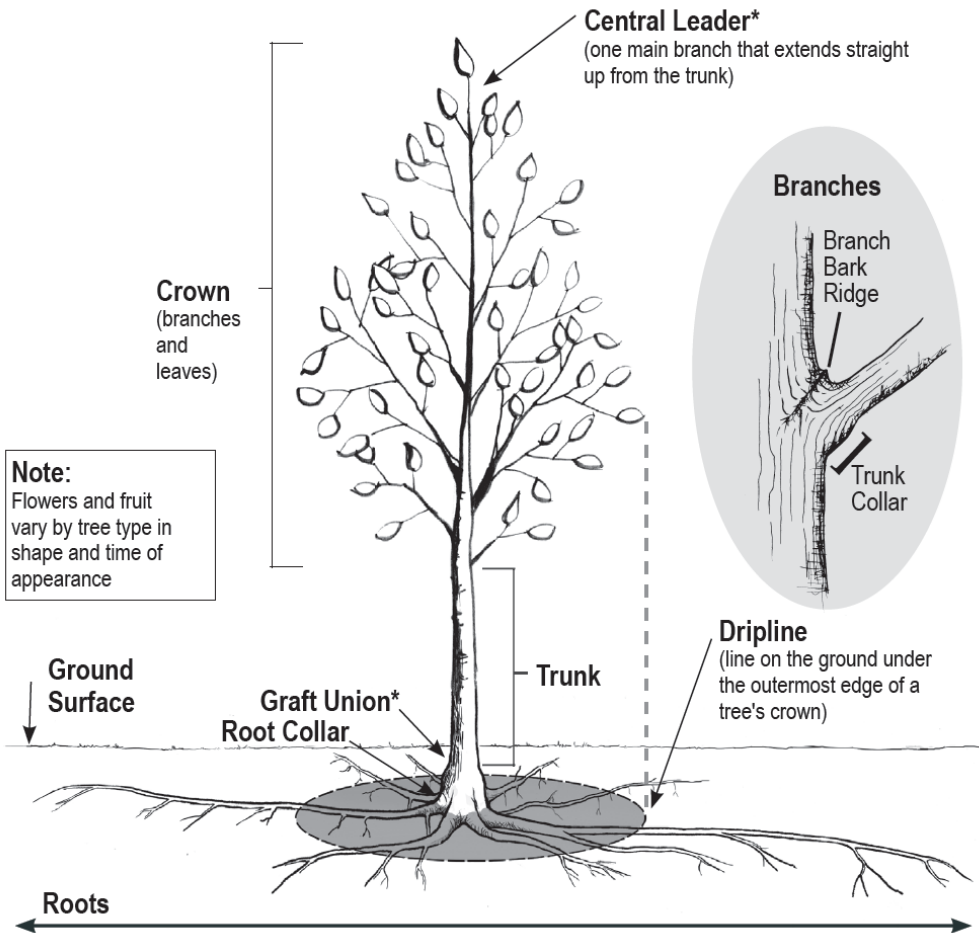
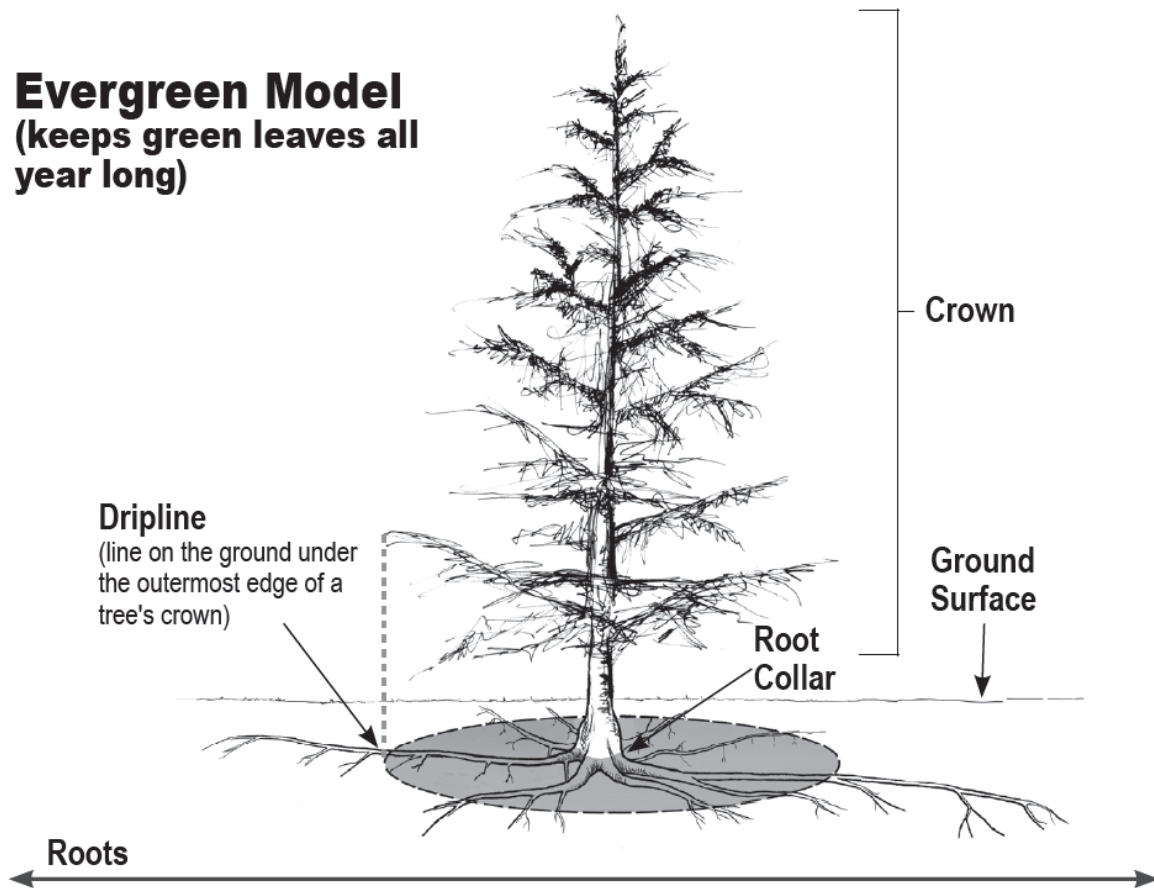


Figure 1: Diagram showing parts of a Deciduous Tree. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info)

## Evergreen Model (keeps green leaves all year long)



**Figure 2:** Diagram showing parts of an Evergreen Tree. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info)

## Planting Season

Trees should be planted in their dormant season before bud break or after leaf drop. Early spring and late fall are recommended due to cool temperatures and ample moisture. Trees planted during the active growing season may require additional care to become established.

## Species Selection

Selecting the right tree for the right place is critical to ensure tree health and limit future conflicts with infrastructure. Species listed in the Northwest Indiana Tree Planting Consortium's *Species Selection List: Approved Species* (Appendix 1) are suited to Northwest Indiana's current and future climate. Other site factors must also be considered when choosing a tree for a specific location. Considerations include site-specific environmental conditions, exposure, surrounding utilities and other possible obstructions to root, stem, or crown growth, maintenance requirements, and availability at local nurseries. Species on the Northwest Indiana Tree Planting Consortium's *Species Selection List: Prohibited Species* (Appendix 1) are not recommended to be planted in Northwest Indiana at this time.

Selecting native tree species to plant (that have been grown within USDA Hardiness Zone 5) helps to advance the health of the local ecosystem by providing a food source and habitat for wildlife and preserve the community's cultural landscape. Native species refers to a "plant that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. Note: The word native is always to be accompanied by a geographic qualifier (that is, native to the Great Lakes region [for example])."<sup>6</sup> Certain non-native tree species that are especially tolerant of harsh urban conditions can be a practical choice to plant, especially when aiming to sustain high levels of species diversity. Non-native species of concern are those that are considered invasive, which should not be planted regardless of the site conditions.

The existing tree species growing in the area must be considered to support high levels of biodiversity in the urban forest. A diverse array of tree species ensures that no one threat can cause significant canopy loss of a street, in a neighborhood, or throughout the community. Different tree species also provide distinct benefits to the community and the ecosystem. An industry guideline recognized as ideal is to maintain tree species diversity at levels of no more than 5% of one tree species (e.g., *Acer rubrum*), 10% of one genus (e.g., *Acer*), and 15% of one family (e.g., *Sapindaceae*) to promote a resilient urban forest. Some communities may have specific requirements regarding tree species diversity. Therefore, it is advisable to thoroughly check for any local policies or requirements pertaining to tree selection and diversity to ensure alignment with community guidelines and objectives.

## Tree Stock

Trees selected for planting should meet or exceed American Standards for Nursery Stock (*ANSI Z60.1-2004*) at the time of planting.<sup>9</sup> All trees should have been grown for a minimum of two growing seasons within 150 miles of Northwest Indiana. Tree stock selected may be inspected to approve or reject prior to installation.

The following must be considered when selecting quality stock:

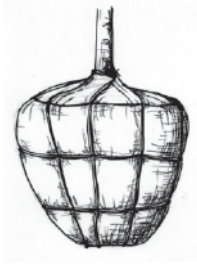
- Appropriate size of the tree
- Proper root ball size and quality – tree shall be centered in the root ball.
- Good trunk flare condition and appropriate location.
- Crown shape and branching structure – shall be fully representative of its species in shape and form.
  - Street trees must not be multi-stemmed and have a central leader.
- Proper branching form.
- No damage to trunk or branches.
- Standard foliage color and density for species.
- No signs of significant stress, insects, or disease.

# PACKAGING

## Roots

Your tree has been packaged in one of the following ways:

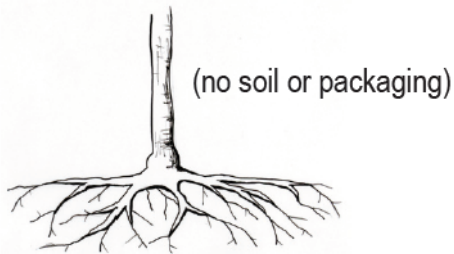
### Balled and burlapped



### Containerized



### Bare root

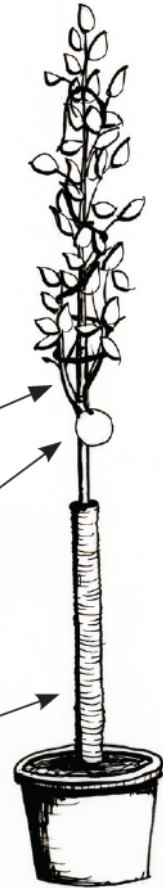


## Trunk and Branches

Twine around branches

Tag(s)

Trunk wrap



**Figure 3:** Diagram showing common packaging options for tree stock. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info)

## Location Selection

### Soil Volume and Type

Trees should be planted in the largest amount of uncompacted soil space as possible. However, in areas of limited space, the following **minimum** soil volumes, by mature tree size, are recommended:

- Small Trees: 300 cubic feet.
- Medium Trees: 600 cubic feet.
- Large Trees: 1,000 cubic feet.

Streetscape redesign and infrastructure replacement projects provide an ideal opportunity to incorporate trees and adequate soil volume into the planning and design phases. There are also technologies to assist in maximizing rooting space available for trees.

Soil pH, structure, texture, density, nutrients, and percolation should be assessed by professionals prior to planting.

Drainage must be adequate for the species being planted. Solving drainage issues is essential for long-term tree health, as saturated soil restricts the tree roots' ability to access oxygen necessary for growth and survival. Methods for addressing drainage issues include:

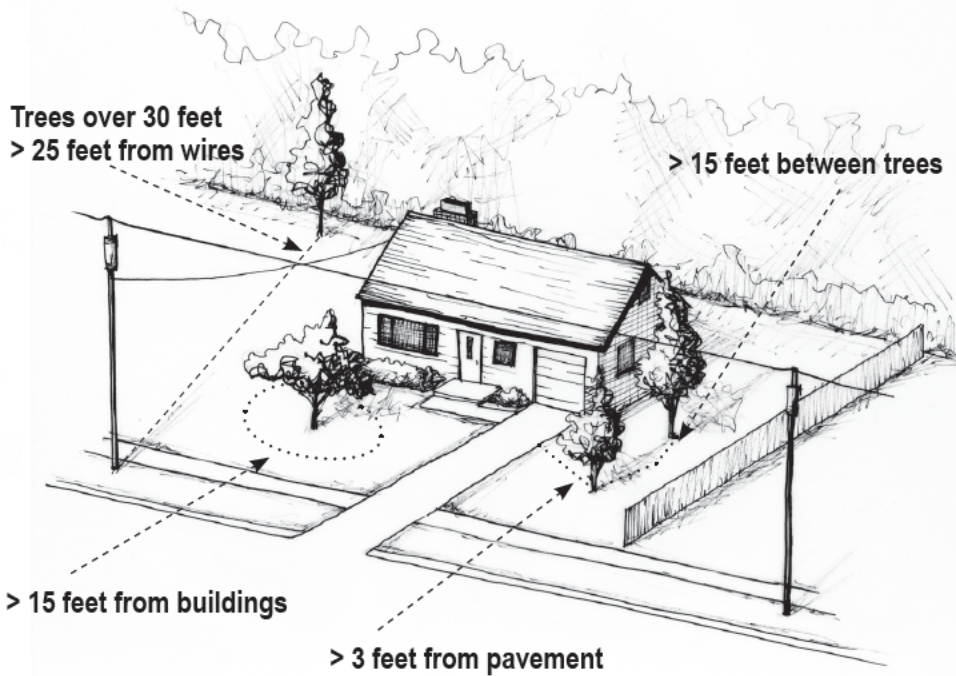
- If a well-drained layer of soil exists beneath a poorly drained layer, drill a vertical hole through the poorly drained layer and fill it with gravel or coarse sand to provide a path for water to flow to the well-drained layer.
- Use a perforated pipe or other product designed to create drainage channels. This approach works well for trees on a slope – a 3-inch fall per 100 feet of pipe is the minimum slope needed for adequate water flow.
- If excess water cannot be drained away, it is best to choose a species tolerant of poorly drained soil or to forgo planting at the site.

## Locate Underground Utilities

The location of utilities and other below and above ground obstructions must be assessed prior to planting – on public *and* private property. At least three working days prior to any digging, 811 (Dig Safe) is required to be contacted to locate any underground utilities in the area of planting. It is recommended to initiate this process earlier to allow for a more informed and comprehensive planting plan, extending beyond the minimum three-day requirement. Contact Dig Safe by calling 811 or visiting their website at <http://www.digsafe.com/>. Representatives/contractors of the utility companies will visit the site and mark the location of underground utilities to highlight any conflicts that may exist. Adjust planting location based on minimum distance recommendations (see Table 2).

## Assess Planting Space

The planting location of your trees should not interfere with buildings, overhead utility lines, pavement, or intersection sightlines as it grows in size (Figure 4; Table 2).<sup>10</sup>



**Figure 4:** Planting Location distances from varying infrastructure. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info)

Table 2 further lists the minimum distances required for trees to be planted away from varying infrastructure.

**Table 2. Required minimum distances from tree trunk.**

Object	Min. distance from center of trunk
Stop sign/red light	30 feet
Traffic signs (speed, yield)	20 feet
Street signs (parking, sweeping)	10 feet
Streetlight	20 feet
Utility pole	10 feet
Alley, driveway, or other vehicular entrance	10 to 20 feet
Crosswalk	10 feet
Corner of street intersection	35 feet
Fire hydrant	10 feet
Building	15 feet

Underground utilities	5 feet
Storm Drain	10 feet
Small Cell Technology	30 feet
Solar Power Technology	30 feet

## Overhead Utilities

Trees greater than or equal to 25 feet in height at maturity should not be planted underneath or within 30 feet of any overhead utility to avoid future conflict.

## Tree Spacing

Distance between existing and planned trees must be assessed before planting (Table 3).

**Table 3. Minimum distance required between trees.**

Tree size (height at maturity)	Minimum spacing distance
Large (>30feet)	30 feet
Small (≤30 feet)	20 feet

## Tree Delivery and Storage

All trees should be tarped during transport to the planting site. Trees should be offloaded using appropriate machinery or by hand, ensuring that trees are not dropped any distance from the truck or trailer to the ground. All trees delivered should be planted within 48 hours of delivery and should be kept moist during this time. Trees stored on site during this time should be located so as not to endanger the public and be separated physically from any nearby construction activities.

## Tree Planting

All tree plantings should be performed and specified according to *ANSI A300 Part 6* standards.<sup>8</sup> All contractors completing planting for the Northwest Indiana Tree Planting Consortium shall provide at least one person to be present at all times during the execution of the work who is knowledgeable with the best practices for proper delivery, handling, and installation of the type of trees being planted. For more detailed information on tree planting of bare root, containerized and balled and burlapped trees please refer to Appendix II: 'Tree Planting Guides'.



## Identify Trunk Flare

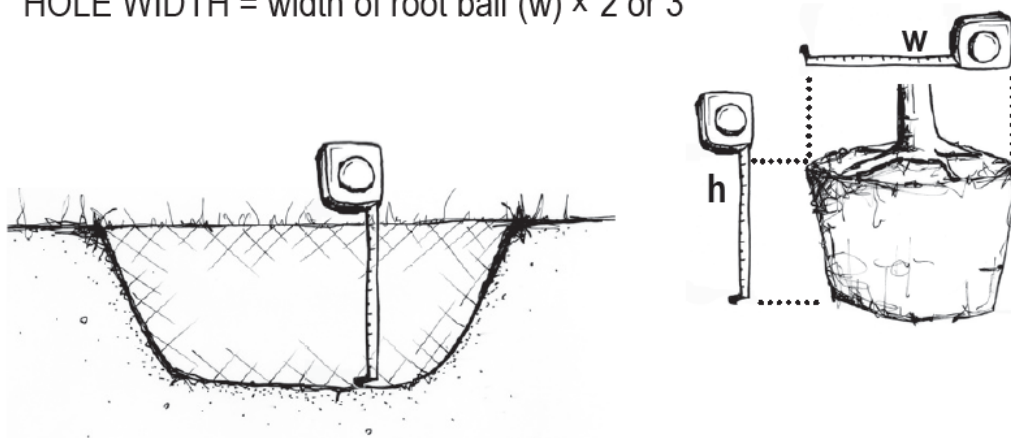
The trunk flare is where the tree's trunk expands to form roots. The flare's location determines the depth of the planting hole, making its identification a critical first step. It can be found by identifying the highest non-fibrous root, which can often be found buried underneath soil. If this is the case, the soil above the trunk flare should be removed.

## Prepare Hole

The depth of the hole should be measured by the bottom of the trunk flare to the bottom of the ball and must not exceed the depth of the root ball (Figure 5). Planting too deeply deprives the tree of oxygen, causing stress and the potential for the growth of unsupportive adventitious roots. The soil directly beneath the root ball should be undisturbed or compacted to prevent settling. The width of the hole should be a minimum of 1.5 times the width of the root ball, and wider in poor-quality soils. The sides of the planting hole should be loose soil, which can be achieved using a shovel. If holes are dug with an auger, hand tools must be used to break up glazing on the sides of the hole.

HOLE DEPTH = height of root ball (h)

HOLE WIDTH = width of root ball (w) × 2 or 3

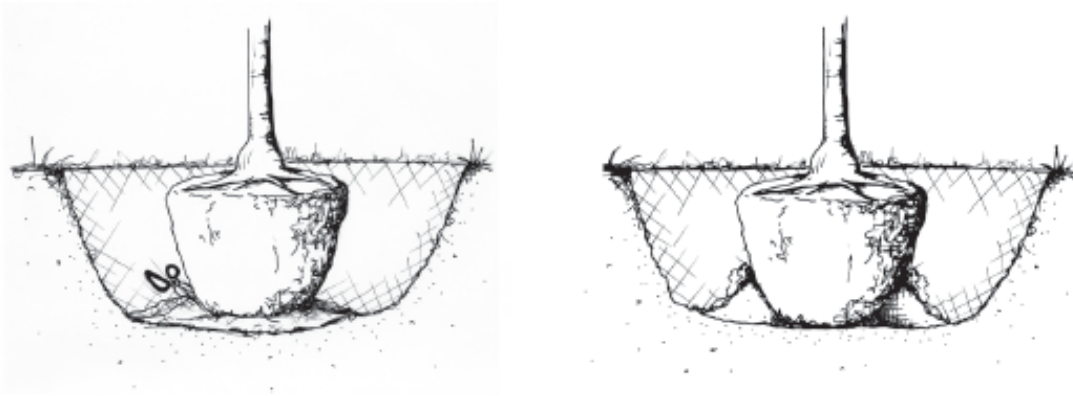


**Figure 5:** Diagram demonstrating the proper dimensions for a hole prior to tree planting. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info)

## Prepare Tree for Planting

A tree should not be removed from its container by pulling its trunk. Instead, a tree in a container should be removed by bending, wiggling, or cutting away the container. For a tree with roots balled and burlapped, the bottom wire should be removed before placing the tree in the hole (Figure 6). After placing the tree in the hole, the remaining wire should be removed, and as much burlap as possible should be cut away circling roots around the root collar, fibrous roots above it, or roots that cannot be straightened. In the case of a container tree, there might be circling roots around the outer part of the root ball. Employ a handsaw to create a box cut on the ball. The cuts should adhere to a 10% rule, ensuring that no more than 10% of the root ball's diameter is removed from any side.

To avoid moisture loss, do not leave the exposed root ball out for an extended period of time, especially in direct sunlight. Inspect the crown, pruning any dead or damaged branches.



**Figure 6:** Diagram demonstrating the proper steps to remove root ball packaging and prepare balled-and-burlapped trees for planting. Without loosening the root ball, cut, peel back, and remove as much of the wire basket and burlap as possible (at least the top third). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

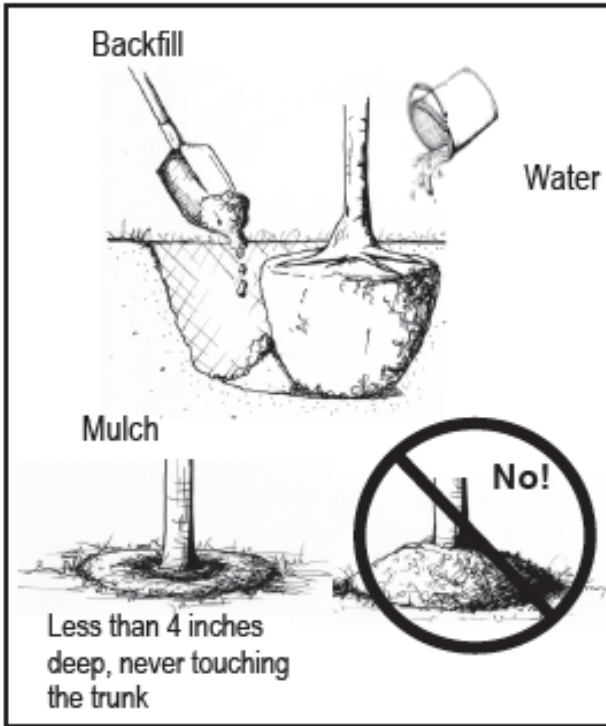
## Placing the Tree

Place the tree in the hole, ensuring that it is centered, then check that the bottom of the trunk flare is at or just above grade (considering that the soil will settle with time and water) (Figure 9). Add or remove soil beneath the root ball as needed to align the bottom of the root collar with grade. Always move the tree by its root ball to avoid damage to its roots.

## Fill Hole

The remaining backfill soil around the root ball in layers, about 6 inches at a time. Lightly but firmly tamp each layer to limit future settling and prevent air pockets. If the soil is dry, apply water after each layer is tamped. Backfill must not be compacted to a density that inhibits root growth.

The soil extracted from the planting hole soil should be used as the backfill soil (Figure 7). If necessary, the backfill can be amended to improve its water holding capacity. Follow the instructions on the amendment label when applying the compound.



**Figure 7:** Diagram demonstrating the proper steps to backfill hole, water and mulch newly planted tree. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

## Berm

Build a berm circling the outside edge of the root ball with the remaining soil. The berm must be a minimum of 3 inches high and 3 inches wide. This structure will encourage water to stay close to the root ball and will act as a barrier from lawnmowers and foot traffic. Berms should be monitored routinely and weeded or rebuilt as needed.

## Water

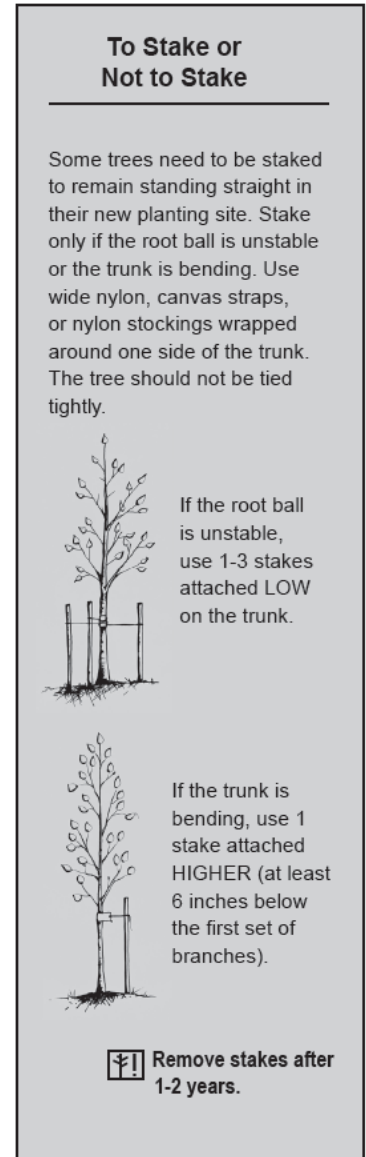
Using low water pressure, apply water until the root ball is thoroughly moist immediately following installation (Figure 7). Lawn sprinklers are not an acceptable method of irrigation for newly planted trees; hose, soaker hose, or bucket are recommended to ensure deep-root watering. Stationary watering methods, such as gator bags, may be considered as a long-term watering method, following the initial hand-watering immediately after planting (see "Maintenance Best Practices" section).

## Mulch

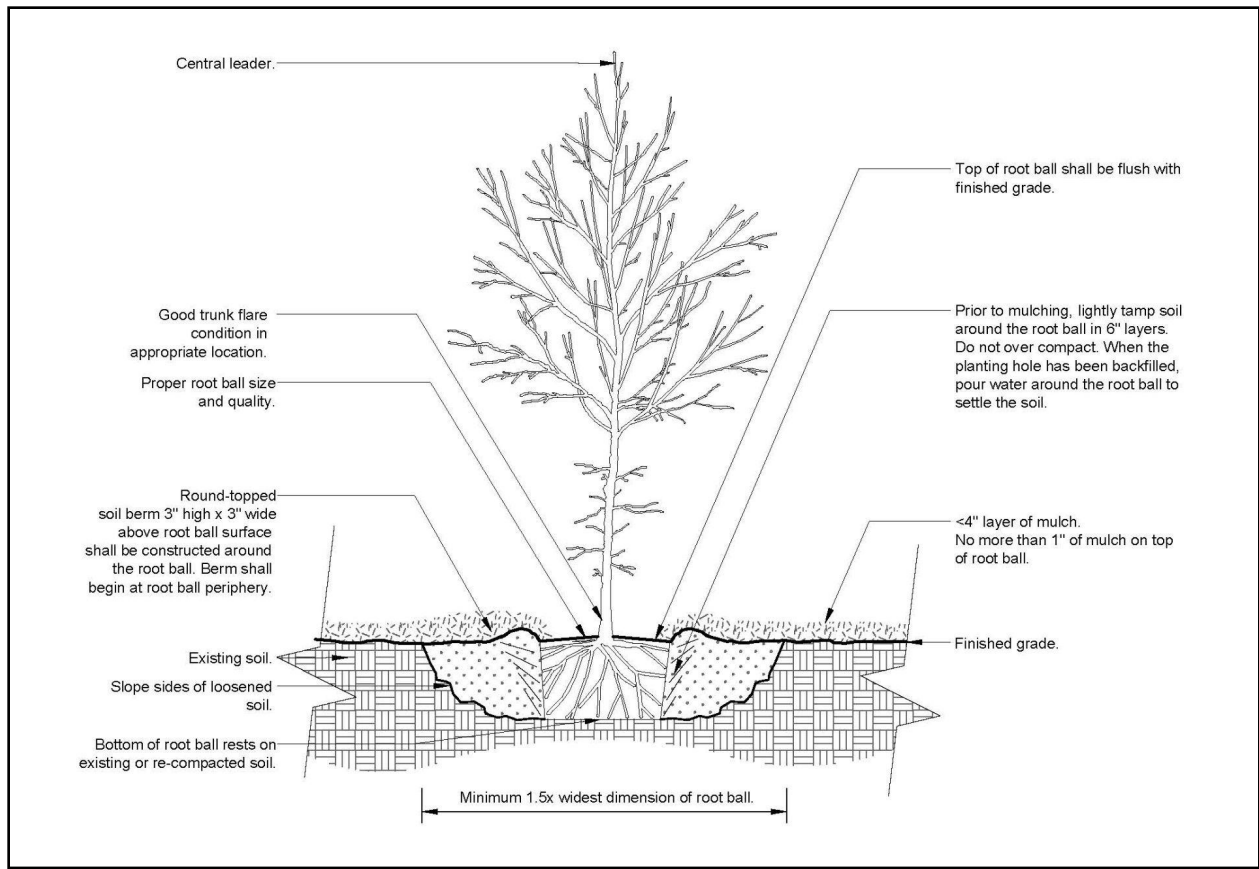
Apply mulch 2-4 inches deep over the filled hole and berm, leaving 3 inches around the trunk clear from mulch to avoid excess moisture against the trunk (Figure 7). Mulch materials may be natural wood chips or shredded bark, needles or leaves. Mulch must be free of any extraneous material such as soil, stones, and debris. Replenish mulch as needed to keep soil moist, nutrient-rich, and temperature regulated. Do not exceed a 4-inch depth of the mulch.

## Stake Tree, as Necessary

Trees establish more quickly and develop stronger root systems and trunks without stakes. If the site is windy, vandalism is a concern, or the root ball shifts after planting, stake the tree with two wooden stakes placed on opposite sides of the tree. Attach nylon strapping or fabric ties to the stake and around the tree. Ties should be loose enough so the tree crown moves up to three times the trunk diameter in the wind, in order to develop a strong taper, and taut enough that the trunk cannot rub the stakes. Straps that are tied around the trunk too tightly or are left on the tree too long may girdle fast-growing young trees (Figure 8). Stakes and straps should be consistently adjusted as needed and removed after one full growing season.



**Figure 8:** Diagram demonstrating proper steps to stake a newly planted tree. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).



**Figure 9: Tree Planting Detail.** (Photo credit: Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University Of Florida.)

## Equity and Inclusion Considerations in the Planting Process

A key component for incorporating diversity, equity, and inclusion (DEI) into a project's planting work is centered around its location and species-based planting decisions, and how well it reflects community priorities. Additionally, how a project prioritizes Disadvantaged Business Enterprises (DBEs) and other related designations through its procurement process for tree stock and contractor services is also key for incorporating equity into its planting work.

# *MAINTENANCE BEST PRACTICES*

A maintenance plan must be established to ensure the survival of a tree after planting. Post-planting care should consist of monitoring, integrated pest management, watering, mulching, pruning, soil management, and adjustment and removal of stakes. Implementing the use of a GIS-based inventory is an effective way to track trees' health and care post-planting. For more detailed information on tree maintenance within natural areas, landscaped areas and municipal orchards please refer to Appendix III: 'Tree Maintenance Guides'.

## Monitoring

Trees should be monitored throughout their lifetime for declining health and signs of pests and diseases. Monitoring a tree's condition allows for proactive care to address the identified issues, such as adjusting water levels for drought-stressed trees, pruning a damaged branch before it peels off the trunk's bark, or providing Integrated Pest Management for trees affected by a pest. If treatment for pests or diseases is required, it is recommended to use the least invasive methods.

## Irrigation

Providing adequate water to young trees is the single most beneficial action that can be taken to ensure establishment. Trees require consistent, thorough watering for at least three years after planting. Underwatering and over-water trees often cause irreversible damage, so it's advisable to test the soil texture at the planting location to understand its water-holding capacity. This knowledge will help establish an effective irrigation plan.

The watering season for most trees mimics the growing season, which is approximately from May 1 through October 31. The growing season for conifer or evergreen trees is year-round. Deciduous trees need no supplemental water during leaf off conditions. Conifers and evergreens should be watered through the winter, although less than during warmer months. Newly planted trees should receive approximately 1 inch of water per inch of caliper per week. To offset lack of water provided by rain or the water table at the site, newly planted trees shall receive a minimum of 2 gallons of water per caliper inch at each watering. However, the amount and frequency of watering will change with species, soil type, seasons, and stage of establishment, making it important to check moisture levels continually. The tree watering basin should be maintained to a height of 3-4 inches high along the perimeter of the planting hole and kept free of weeds and debris.

There are several methods of irrigation that can effectively water trees:

- Irrigation bags
  - Irrigation bags wrap around the bottom half of a tree's trunk or sit on top of the tree's basin in a doughnut shape.
  - Irrigation bags slowly release water over the following 10 hours.
  - Bags must have a capacity of at least 15 gallons and no more than 20 gallons of water and be made of durable material.

- Irrigation bags must be maintained to ensure water freely drips from the lower surface and remains free of any other damage. At the end of the watering season, the responsible party should remove all watering bags for winter storage. Bags should be removed after a tree's establishment period.
- Hand-watering
  - Consists of a simple hose and manual shut-off valve. Water can be directly placed where needed and shut off to prevent over-watering and run-off.
  - Use a slow trickle or low-pressure setting to allow the water to penetrate the soil without causing soil displacement or runoff.
- Drip irrigation
  - Perforated flexible hoses laid directly around the root zone soaks soil from the ground-level. Water pressure is controlled by emitters; the number of emitters used for each plant and the flow rate for each emitter will depend on the size of the tree.

All irrigation systems should be monitored throughout the watering season to identify any damage, inefficiencies, or adjustments needed to increase the survivability of the trees.

## Berm and Mulch

Berms should be monitored routinely and rebuilt as needed to retain water close to the tree's critical root zone and act as a barrier to foot traffic and lawn mowers. Berms should be 3 inches high and 3 inches wide and must be kept clear of unwanted vegetation and other debris. Unwanted vegetation should be removed by hand; chemical weed control directed at the berm is not permitted on Consortium trees.

Mulch is critical for retaining moisture in the soil, improving the soil biology, regulating soil temperature, and reducing weeds. Mulch should be replenished within and on the berm as needed to maintain a layer 2-4 inches deep, leaving 3 inches around the trunk clear from mulch to avoid conditions favorable to decay, disease, and pests.

## Pruning

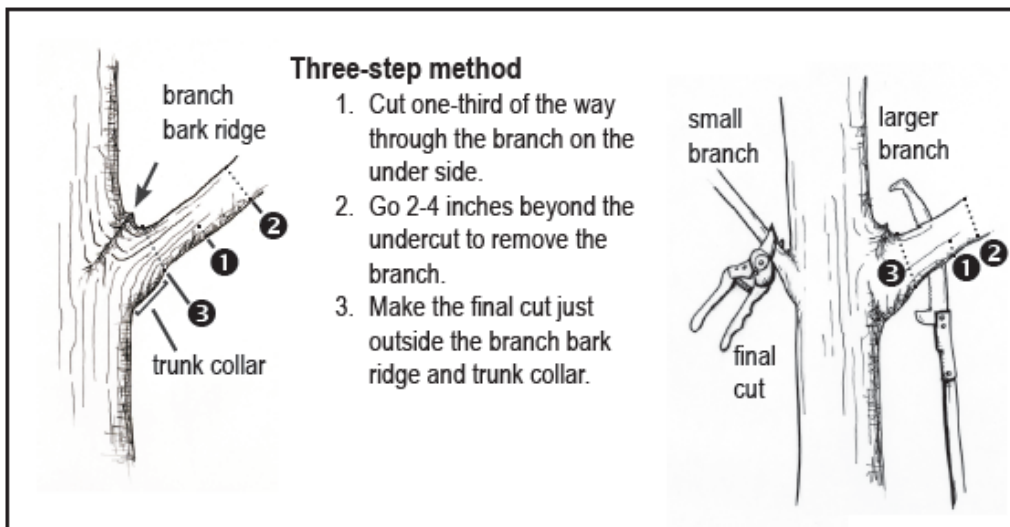
Young trees need periodic pruning to develop good form and branching structure – reducing future tree defects and increasing the tree's longevity. It is recommended that pruning should be performed by a licensed arborist in accordance with the latest revision of ANSI A300 *Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance* (Figure 10).

Pruning should be kept to a minimum for the first year after tree installation to allow the tree to use its existing foliage to manufacture carbohydrates for growth. At planting trees should be pruned of all dead, diseased, and dying branches.

After the first year, trees should be pruned to improve structure in addition to pruning of all dead, diseased, and dying branches in addition. No more than 20% of the living crown of an individual tree shall be removed. To structurally prune a young tree, the first step is to identify the stem that will make the best dominant leader. Although there may be several options, the selected

leader should be centered and upright, and free of damage or other defects that could compromise its strength. The leader's identification steers the following pruning decisions, as branches and stems in competition should be removed or subordinated. Competition includes stems similar in height, and stems or branches similar in diameter to one another.

Vertical and radial spacing of branches must be considered, making sure to remove branches that are clustered together and growing from the same point on the trunk, or are crossing. The ideal spacing between branches on young trees is 4-6 inches. Short and small diameter branches should be retained along the trunk or within the canopy of young trees to encourage trunk taper and protect trees from vandalism and sun scald.

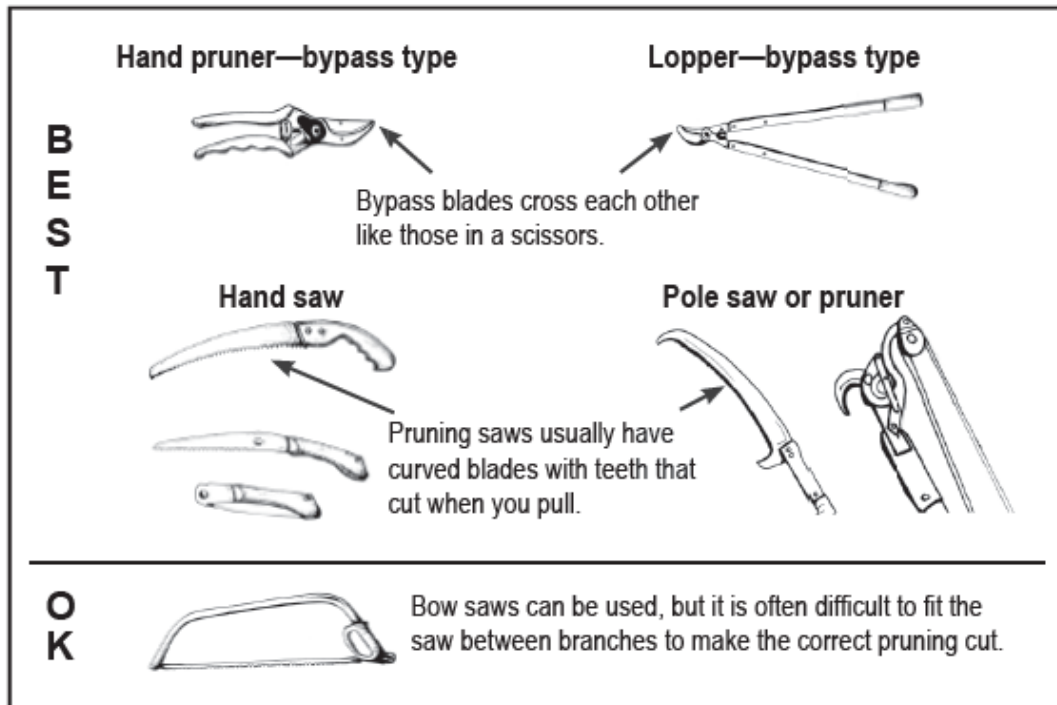


**Figure 10:** Diagram demonstrating best practices of pruning newly planted trees. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

Sharp tools - including hand saw and pruners, loppers, or pole saw and loppers - shall be used, and must be cleaned thoroughly with alcohol, hydrogen peroxide, or chlorine bleach before pruning (Figure 11). In the case of trees known to be infected with diseases such as ceratocystis, hypoxylon canker, oak wilt, or verticillium wilt, the tool must be cleaned after each cut. Treatment of cuts and wounds with wound dressing or paints has not been shown to be effective in preventing or reducing decay and shall not be used. Pruning of young trees should happen during leaf off conditions to limit the spread of disease and allow for the best view of structure too.



## Pruning Tools



*Figure 11: Diagram showcasing best and acceptable pruning tools. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).*

## Fertilization

Fertilization supplies nutrients to trees, supports their crown and root growth, and contributes to the overall well-being and vigor of trees. Trees develop fibrous, water absorbing root system when fertilized. However, fertilizer should not be directly applied to newly planted trees during their first year of establishment.

## Stakes

Stakes should provide support for young trees while not inhibiting them from moving in the wind. The assisted movement aids in the development of a stabilizing trunk taper and root system. The effectiveness of installed stakes should be monitored and adjusted and removed as needed. Typically, stakes are removed after 1-year or one full growing season once they are capable of supporting themselves.

## Equity and Inclusion Considerations in the Maintenance Process

A primary method for incorporating DEI into a project's maintenance work is centered around how a project prioritizes DBEs and other related designations in its procurement of contractor services.

Opportunities for including volunteer training for tree care and maintenance (as part of a

planting project's community event programming) can also serve to support equity and inclusion priorities. These trainings provide opportunities to increase urban forestry education for community members and build a stewardship connection between these groups and the project's trees. While volunteer trainings rarely replace the need for municipal contractors to complete the more time, labor, and equipment-intensive aspects of maintenance work, they serve as critical opportunities for skill building and education, which can only serve to improve overall canopy health in under- resourced low to moderately resourced communities.

# TREE CITY USA RECOGNITION

How does a municipality or a local unit of government effectively put the fiscal, operational, and programmatic structures in place to support long range community forestry? While there are numerous frameworks for advancing community forestry, Tree City USA is an established standard for institutionalizing these practices within local governments. While attaining official certification as a “Tree City” may not fit every community (based on existing capacity and priorities), the standard nonetheless provides an essential framework for how local governments can advance canopy restoration and management. Provided below is a summary of the program, its requirements, and best practices.

## Tree City USA Summary

Tree City USA, one of the Arbor Day Foundation’s longest-running programs, provides communities with a four-step framework for guiding forestry activities and making progress toward their forestry-related goals, like increasing canopy cover and beautifying public spaces.

The Tree City USA program, in partnership with the [U.S. Forest Service](#) (USFS) and the [National Association of State Foresters](#), also recognizes and celebrates communities that achieve the four program standards for community forestry. Successful communities are provided with flags, signage, and other materials to help educate residents and promote the community’s commitment to environmental stewardship through forestry. [Click here to view/download an easy-to-read summary of the program.](#)

## Tree City USA Requirements

### Establish a tree board or department.

Formalize how forestry responsibilities will be delegated among municipal or county personnel. Doing so will allow for the creation of an organized, effective forestry plan and provide accountability for tree-related decision making. It is recommended that both residents and business owners are involved in the process.

#### **Responsibilities can be assigned to a:**

- Professional forester
- Arborist
- City department
- Citizen-led tree board
- Combination of the above

A free, online training course, Tree Board University, has been made available through a partnership between USFS Urban and Community Forest Assistance Program and the Arbor Day Foundation. The course teaches individuals “about trees, about people, and about serving in a citizen advisory role in your city, town, or village”. The course also provides access to an online networking community of tree board members throughout the U.S.

## Establish a tree ordinance.

An effective tree ordinance will assign definitive authority over public trees; provide guidance for tree planting, maintenance, and removal in public spaces; and establish enforcement mechanisms.

### Sample ordinances:

- [Municipal Tree Ordinance \(with Tree Board\)](#)
- [Municipal Tree Ordinance \(without Tree Board\)](#)

### Additional resources:

- [American Society of Consulting Arborists - Tree Ordinances](#)
- [Guidelines for Developing and Evaluating Tree Ordinances \(International Society of Arboriculture\)](#)
- [Tree Ordinance Development Guidebook \(Georgia Forestry Commission\)](#)
- [Developing Successful Tree Ordinances \(North Carolina State Extension\)](#)

## Allocate at least \$2 per capita for community forestry in the annual budget.

Establishing a dedicated local funding source, whether through a special levy or as a specific line item in the general operating budget, will provide a critical basis for supporting ongoing planting and maintenance work, as well as a basis for matching larger federal grants. In a community of 50,000, this would entail \$100,000 of municipal resources invested towards community forestry initiatives (which includes cash expenditures, personnel time, and equipment, for example). While planning and accountability through tree boards and ordinances precede public investment toward community forestry, many communities already meet this investment. Nonetheless, as fiscal resources can fluctuate based on economic factors, effective planning and management stands as critical for meeting the \$2 per capita benchmark.

## Host an Arbor Day observance and proclamation.

Demonstrating public support for the forestry program is a relatively simple way to engage community members and increase awareness of local forestry efforts, benefits and priorities. Arbor Day celebrations can include tree plantings, tree care activities, or award ceremonies that honor particularly involved members of the community.

## *FORESTRY PROGRAM GOAL SETTING*

Setting goals is an important step toward ensuring that forestry programs are implemented in a deliberate manner and are focused on achieving the identified goals. The goal-setting exercise might focus on implementation goals, such as planting a certain number of trees; or environmental and quality-of-life goals (e.g., decreasing flood events in residential areas, reducing temperatures by providing shade along streets). Some agencies or departments might embark on a more focused, near-term goal-setting exercise that identifies the implementation of specific programs to support broader forestry goals, such as establishing a Relative Performance Index to understand the age, health, and condition of publicly owned trees, by species.

USFS, [American Forests](#), and the [National Association of Regional Councils](#) have developed a free, online [Community Assessment and Goal-Setting Tool](#) to help decision makers and practitioners assess their department's or agency's current forestry program and set achievable goals to align those programs with best practices. This tool can be used to effectively prepare a community for Tree City USA recognition.

### Self-Guided Assessment of Forestry Practices

In addition to the resources mentioned above, Delta Institute has developed the following assessment framework for department or agency personnel to assess the goals, outcomes, and existing practices of a forestry program. This self-assessment allows personnel to make decisions about how best to align current and future programs with the best practices described above. A standalone, printable version of this section is located in 'Appendix IV: Self-Guided Assessment for Forestry Practices'.

### Community Goals

Identifying community goals is essential for creating an urban forestry management plan that is responsive to local needs, values, and aspirations. By engaging residents in the goal-setting process, planners can develop strategies that are relevant, effective, and sustainable, ultimately leading to healthier and more vibrant communities.

Goal	Briefly describe the goals that your department or agency have set for forestry-related activities.
1	
2	
3	

## Targeted Outcomes

Identifying targeted outcomes help communities create a more focused, measurable, and adaptive urban forestry management plan that can effectively meet the needs of both the community and the environment.

Targeted Outcome	Briefly describe the desired outcomes that will result from reaching the goals described above.
1	
2	
3	

Targeted Outcome	How well do the outcomes align with your goals?
1	
2	
3	

Targeted Outcome	Are the targeted outcomes quantifiable or qualitative? If so, how? See Table 4, below, for potential outcome metrics.
1	
2	
3	

**Table 4: Potential Forestry Outcomes**

<b>Quantitative Outcomes Table</b>	<b>Investments</b> <ul style="list-style-type: none"> <li>• Total local public dollars invested.</li> <li>• Total local public dollars leveraged.</li> <li>• Total federal public dollars leveraged.</li> <li>• Total private dollars leveraged</li> </ul>
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	<p><b>Green Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Number of trees planted.</li> <li>• Number of trees maintained.</li> <li>• Number of species planted or maintained.</li> <li>• Square feet on new canopy added</li> </ul>
	<p><b>Reduced Environmental Impact</b></p> <ul style="list-style-type: none"> <li>• Estimated net reduction in surface temperature.</li> <li>• Gallons of runoff treated or captured.</li> <li>• Net tons of CO2 emissions sequestered</li> </ul>
	<p><b>Community Benefits</b></p> <ul style="list-style-type: none"> <li>• Total jobs created.</li> <li>• Total jobs maintained.</li> <li>• Total volunteers engaged.</li> <li>• Total neighborhoods served</li> </ul>
<b>Qualitative Outcomes Table</b>	<p><b>Government Initiatives</b></p> <ul style="list-style-type: none"> <li>• Tree board created or maintained.</li> <li>• Plans or inventories created.</li> <li>• Ordinances created.</li> <li>• Initiatives or programs created.</li> <li>• Initiatives or programs supported.</li> </ul>

### Existing Programs and Initiatives

Identifying existing programs and initiatives provides communities with valuable insights, resources, and opportunities to enhance the effectiveness, efficiency, and sustainability of their urban forestry management efforts. By building on what already exists, communities can create stronger, more integrated, and more impactful management plans that benefit both residents and the urban environment.



Briefly describe the departments, governing boards, or agencies that oversee and/or implement forestry-related activities.	Should additional groups/individuals be involved?	If so, which ones? Describe their role.

Briefly describe any ordinances or guidelines that apply to forestry-related activities conducted by your department or agency.	How do these policies and regulations support your goals?

Briefly describe any events or additional programming used to engage residents or other community groups around forestry-related activities.	What's worked well?	What lessons can be learned from these activities?

**Funding**

Often, community groups and municipalities need a “starting point” to assess their needs prior to submitting forestry-focused grant requests. This is a simple starting point to canvas current forestry funding in your community.

Briefly describe how forestry-related activities are currently funded (dedicated local funding, pass-through grants, etc.).	How much of your department/agency's funding goes towards tree planting and maintenance?	What are the benefits and drawbacks associated with these sources of funding?

## S.W.O.T. Analysis

This exercise will help identify the strengths, weaknesses, threats, and opportunities associated with your department or agency’s ability to conduct forestry-related activities.

	<b>Strengths:</b> Describe what your organization excels at.	<b>Weaknesses:</b> Describe challenges that your organization faces.	<b>Opportunities:</b> Describe favorable factors, external to your agency or department, that can provide an advantage to your organization.	<b>Threats:</b> Describe factors that could potentially harm your agency or department.
Forestry-related				
Non-forestry related				

## Considering Equity and Inclusion in the Forestry Goal Setting & Assessment Process

To incorporate DEI principles into the Forestry Goal Setting & Assessment process, consider the following diagnostic questions:

- What forestry-goals in your community specifically benefit low resource communities?
- Of the targeted qualitative and quantitative outcomes illustrated in Table 4, which can be associated with projects occurring within low to moderately resourced communities?
  - What ordinances, policies, and guidelines exist that advance forestry (and its benefits) in low to moderate resourced communities?
- Is there programming in your community intended to engage low to moderate income residents around forestry-related activities?

- What funding sources (or existing programs) exist in your community that support tree planting and maintenance in low to moderate resourced neighborhoods?
- What are the Strengths, Weaknesses, Opportunities, and Threats that relate to your department or agency's ability to advance forestry-related activities in low to moderate-resourced neighborhoods, in contrast with the wider community?

While aspects of goal setting and self-assessment are broader than the topic of diversity, equity, and inclusion, incorporating a DEI lens helps to provide a municipality or agency with an understanding of whether their forestry-related activities successfully address environmental health or quality of life concerns in underserved areas.

# *APPENDIX I: TREE SPECIES SELECTION GUIDE*

## User Guide

### Hello Northwest Indiana Tree Planting Consortium Communities,

Welcome to the species selection list for Lake County, which is a compilation of multiple tree nursery inventory lists and includes species hardy in zone 5. Participating nurseries are:

Nursery	Location
Dogwood Hills Tree Farm	Middlebury, IN
Kankakee Nursery Co.	St. Anne, IL
Schneider Nursery	Seymour, IN
Woody Warehouse Nursery Inc.	Lizton, IN
Hoette Farms and Nursery	New Florence, MO
Possibility Place Nursery	Monee, IL

As consortium leading partners, we aim to annually update this list while partnering with nurseries within 300 miles of Lake County, IN.

The list is formatted to allow users to focus on specific interests dynamically. You can change your filters to view different species subsets without altering the original list. Below are directions on using the filtering system.

The "Tree and Shrub Species" tab contains both common and botanical names for each species. If there's a variety/cultivar, it will be listed as a separate species.

Each species is described in multiple ways in the subsequent columns. These descriptions aid in the planning process.

The "Planting Frequency Recommendation" column presents a simplified matrix developed by Davey Resource Group, considering climate change predictions, pest threats, and diversity challenges. Climate change predictions are adapted from the Chicago, Illinois Climate Change Vulnerability of Urban Trees study conducted by the Northern Institute of Applied Climate Science.

The "Environmental Tolerance" columns encompass various site characteristics for tree planting planners to consider, including preferences for shade, sensitivity to drought or flooding conditions, and tolerance to road or foot traffic winter salting. The "Usage Qualities" columns provide characteristics such as mature tree size, recommended landscape placement, Indiana nativeness, suitability for a community fruit consumable orchard, leaf type classification, anticipated flowering times, and flower color classification.

The "Prohibited Species" tab contains a shortlist of species that should not be planted or require careful consideration due to potential threats. References to "invasive," "impacted," and "aggressive" highlight their classification by the Indiana Invasive Species Council, potential long-term survival concerns due to pests, and competitive capabilities with surrounding vegetation, respectively.

#### Filtering directions for the Tree and Shrub Species tab:

1. Filter the data: Find drop-down arrows next to each column header in your table.
2. Click the filter arrow: Choose the column you want to filter.
3. Filter by values: Select specific values to display by checking or unchecking the boxes.
4. Applying multiple filters: Refine results by applying filters to multiple columns simultaneously.
5. Clearing filters: Remove filters by clicking the filter arrow and selecting "Clear Filter From [Column Name]" or using the "Clear" option in the "Sort & Filter" group.
6. Reapplying filters: After modifying data, click the filter arrow and select "Reapply Filter" to reflect the changes.

Happy planting from your Northwest Indiana Tree Planting Consortium Partners!

**Delta Institute**

**Davey Resource Group, Inc.**

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Abies balsamea</i>	fir, balsam	Low	Partially Tolerant	Upland	Moderately Sensitive	Moderately Sensitive	Sensitive	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Abies concolor</i>	fir, white	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Abies fraseri</i>	fir, frasier	Low	Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Acer ginnala</i>	maple, amur	Low	Partially Tolerant	Upland/Lowland	Moderately Tolerant	Moderately Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer giriseum</i>	maple, paperbark	Low	Moderately Tolerant	Lowland	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Yellow White
<i>Acer miyabei 'Morton'</i>	maple, State Street miyabe	Low	Moderately Tolerant	Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer nigrum</i>	maple, black	Medium	Tolerant	Upland/Lowland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer palmatum 'Bloodgood'</i>	maple, Bloodgood Japanese	Low	Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer palmatum var. dissectum 'Tamukeyama'</i>	maple, Tamukeyama Japanese	Low	Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer pensylvanicum</i>	maple, striped	Low	Tolerant	Upland	Moderately Sensitive	Moderately Tolerant	Undetermined	Small Tree	No	North America	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer pseudosieboldianum</i>	maple, Korean	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Yellow
<i>Acer rubrum</i>	maple, red	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer rubrum 'Autumn Radiance'</i>	maple, Autumn Radiance	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer rubrum 'Magnificent Magenta'</i>	maple, Burgundy Belle	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer rubrum 'Autumn Flame'</i>	maple, Autumn Flame	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer rubrum 'Brandywine'</i>	maple, Brandywine	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer rubrum 'Frank Jr.'</i>	maple, Redpointe	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer rubrum 'Franksred'</i>	maple, Red Sunset	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer rubrum 'October Glory'</i>	maple, October Glory	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer rubrum 'Somerset'</i>	maple, Somerset	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer rubrum 'Sun Valley'</i>	maple, Sun Valley	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer rubrum 'Katie Cole'</i>	maple, Summer Sensation	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer saccharinum</i>	maple, silver	Low	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer saccharinum 'Silver Queen'</i>	maple, Silver Queen	Low	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer saccharum</i>	maple, sugar	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer saccharum 'Commemoration'</i>	maple, Commemoration	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer saccharum 'Baista'</i>	maple, Fall Fiesta	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer saccharum 'Green Mountain'</i>	maple, Green Mountain	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous



Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Acer saccharum</i> 'JFS-Caddo2'	maple, Flashfire	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer saccharum</i> 'Legacy'	maple, Legacy sugar	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer spicatum</i>	maple, mountain	Low	Moderately Tolerant	Upland	Moderately Sensitive	Moderately Tolerant	Undetermined	Small Tree	No	North America	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer tataricum</i> 'Gar Ann'	maple, Hot Wings	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Some Tolerance	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	Greenish Yellow
<i>Acer tataricum</i> subsp. <i>ginnala</i> 'Flame'	maple, Flame amur	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Some Tolerance	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Yellow White
<i>Acer truncatum</i> x <i>platanooides</i> 'JFS-KW202'	maple, Crimson Sunset	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Yellow White
<i>Acer</i> x <i>freemanii</i> 'Armstrong'	maple, Armstrong	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Acer</i> x <i>freemanii</i> 'Armstrong Gold'	maple, Armstrong Gold	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer</i> x <i>freemanii</i> 'Bailston'	maple, Matorador	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer</i> x <i>freemanii</i> 'Celzam'	maple Celebration	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer</i> x <i>freemanii</i> 'Jeffersred'	maple, autumn blaze	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Acer</i> x <i>freemanii</i> 'Marmo'	maple, Marmo	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Acer</i> x <i>Pacific Sunset</i>	maple, Pacific Sunset	Low	Partially Tolerant	Undetermined	Tolerant	Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Aesculus flava</i>	buckeye, yellow	Low	Tolerant	Lowland	Moderately Sensitive	Moderately Sensitive	Sensitive	Large Tree	No	Indiana	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Aesculus glabra</i>	buckeye, Ohio	Low	Tolerant	Lowland	Moderately Sensitive	Moderately Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Yellow
<i>Aesculus glabra</i> 'J.N. Select'	buckeye, J.N. Select	Low	Tolerant	Lowland	Moderately Sensitive	Moderately Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Aesculus hippocastanum</i> 'Baumanii'	horsechestnut, Baumanii	Low	Moderately Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Aesculus parviflora</i>	buckeye, bottlebrush	Low	Partially Tolerant	Lowland/ Upland	Sensitive	Sensitive	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Late Spring	White and Red
<i>Aesculus pavia</i>	buckeye, red	Medium	Moderately Tolerant	Lowland/ Upland	Moderately Tolerant	Tolerant	Some Tolerance	Small Tree	Yes	North America	No	Deciduous Broadleaf	Late Summer	White and Red
<i>Aesculus</i> x <i>arnoldiana</i> 'Autumn Splendor'	buckeye, Autumn Splendor	Medium	Moderately Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Red
<i>Aesculus</i> x <i>carnea</i> 'Briotii'	horsechestnut, Ruby Red	Low	Moderately Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Yellow
<i>Aesculus</i> x <i>carnea</i> 'Ft. McNair'	horsechestnut, Fort McNair	Low	Moderately Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Red
<i>Alnus incana</i> subsp. <i>rugosa</i>	alder, speckled	Medium	Partially Tolerant	Lowland	Moderately Sensitive	Tolerant	Moderately Tolerant	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Pink
<i>Alnus spaethii</i>	alder, Spaeth's serviceberry, Saskatoon	Low	Partially Tolerant	Lowland	Moderately Sensitive	Tolerant	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Purple
<i>Amelanchier alnifolia</i>	serviceberry, Saskatoon	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	North America	Yes	Deciduous Broadleaf	Late Winter	Inconspicuous
<i>Amelanchier arborea</i>	juneberry	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub/Small Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier canadensis</i>	serviceberry, shadblow	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Shrub/Small Tree	No	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier humilis</i>	low shadblow	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Late Spring	White

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Amelanchier interior</i>	juneberry	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier laevis</i>	serviceberry, Allegheny	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier laevis</i> 'JFS-Arb	serviceberry, Spring Flurry	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier lamarckii</i>	juneberry	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier x grandiflora</i> 'Autumn Brilliance'	serviceberry, Autumn Brilliance	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier x grandiflora</i> 'Princess Diana'	serviceberry, Princess Diana	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amelanchier x grandiflora</i> 'Robin Hill'	serviceberry, Robin Hill	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	Yes	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Amorpha canescens</i>	lead plant	High	Moderately Tolerant	Upland	Tolerant	Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Amorpha fruticosa</i>	indigo bush	High	Moderately Tolerant	Lowland	Tolerant	Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Purple Orange
<i>Aronia arbutifolia</i>	chokeberry, red	High	Partially Tolerant	Lowland	Tolerant	Tolerant	Moderately Tolerant	Shrub	No	North America	Yes	Deciduous Broadleaf	Early Summer	Purple Orange
<i>Aronia melanocarpa</i>	chokeberry, black	High	Partially Tolerant	Lowland	Tolerant	Tolerant	Moderately Tolerant	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Aronia prunifolia</i>	chokeberry, purple	High	Tolerant	Lowland	Tolerant	Tolerant	Moderately Tolerant	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Late Spring	White
<i>Asimina triloba</i>	paw paw	High	Moderately Tolerant	Lowland	Moderately Tolerant	Tolerant	Undetermined	Small Tree	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Betula alleghaniensis</i>	birch, yellow	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Purple
<i>Betula lenta</i>	birch, sweet	Medium	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	Yes	North America	No	Deciduous Broadleaf	Late Spring	Yellow Purple
<i>Betula nigra</i>	birch, river	High	Intolerant	Lowland	Moderately Sensitive	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula nigra</i> 'BNMTF'	birch, Dura Heat River	High	Intolerant	Lowland	Moderately Sensitive	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula nigra</i> 'Cully'	birch, Heritage River	High	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula papyrifera</i>	birch, paper	Low	Partially Tolerant	Upland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula papyrifera</i> 'Oenci'	birch, Renaissance Oasis	Low	Partially Tolerant	Upland	Moderately Tolerant	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula pendula</i> 'Royal Frost'	birch, Royal Frost European	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula platyphylla</i> 'Fargo' DAKOTA PINNACLE	birch, Dakota Pinnacle	Low	Partially Tolerant	Undetermined	Sensitive	Moderately Tolerant	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula populifolia</i>	birch, grey	Low	Intolerant	Upland	Sensitive	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula populifolia</i> 'Whitespire'	birch, Whitespire	Low	Intolerant	Upland	Sensitive	Sensitive	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula pumila</i>	birch, dwarf	Low	Intolerant	Lowland	Undetermined	Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Betula x 'Crimson Frost'</i>	birch, Crimson Frost	Low	Partially Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Large Tree	No	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Buxus 'Green Gem'</i>	boxwood, green gem	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Greenish Yellow
<i>Buxus 'Green Mountain'</i>	boxwood, green mountain	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Inconspicuous

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Buxus 'Green Velvet'</i>	boxwood, green velvet	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Inconspicuous
<i>Buxus microphylla 'Winter Gem'</i>	boxwood, winter gem Korean	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Inconspicuous
<i>Buxus sempervirens 'Dee Runk'</i>	boxwood, Dee Runk	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Inconspicuous
<i>Buxus sinica var. insularis 'Justin Brouwers'</i>	boxwood, Justin Brouwers	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Inconspicuous
<i>Buxus 'Wintergreen'</i>	boxwood, wintergreen	Low	Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Shrub	No	No	No	Evergreen Broadleaf	Late Spring	Inconspicuous
<i>Calycanthus floridus</i>	sweetshrub	High	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Carpinus betulus 'Fastigiata'</i>	hornbeam, European	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Carpinus betulus 'Frans Fontaine'</i>	hornbeam, Frans Fontaine	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Yellow Green
<i>Carpinus caroliniana</i>	hornbeam, American	Medium	Tolerant	Lowland	Moderately Sensitive	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Yellow Green
<i>Carya cordiformis</i>	hickory, bitternut	High	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Yellow Green
<i>Carya illinoensis</i>	pecan	High	Intolerant	Lowland	Moderately Sensitive	Moderately Tolerant	Sensitive	Large Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Carya lacinososa</i>	hickory, shellbark	High	Moderately Tolerant	Lowland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Carya ovalis</i>	hickory, red	High	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Carya ovata</i>	hickory, shagbark	High	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Carya tomentosa</i>	hickory, mockernut	High	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Catalpa speciosa</i>	catalpa, northern	High	Partially Tolerant	Lowland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Catalpa speciosa 'Hiawatha 2'</i>	catalpa, Heartland	High	Partially Tolerant	Lowland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Catalpa x erubescens 'Purpurea'</i>	catalpa, purple	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Large Tree	No	No	No	Deciduous Broadleaf	Early Summer	White
<i>Ceanothus americanus</i>	New Jersey Tea	High	Partially Tolerant	Upland	Tolerant	Undetermined	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Early Summer	White
<i>Celtis laevigata</i>	sugarberry	Medium	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Sensitive	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Celtis occidentalis</i>	hackberry, common	High	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Sensitive	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Celtis occidentalis 'Chicagoland'</i>	hackberry, Chicagoland	High	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Sensitive	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Celtis tenuifolia</i>	hackberry, dwarf	Medium	Intolerant	Lowland/Upland	Undetermined	Undetermined	Undetermined	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Cephalanthus occidentalis</i>	buttonbush	High	Tolerant	Lowland	Intolerant	Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Cercidiphyllum japonicum</i>	katsura tree	Low	Moderately Tolerant	Lowland	Sensitive	Moderately Sensitive	Undetermined	Large Tree	No	No	No	Deciduous Broadleaf	Early Summer	White
<i>Cercis canadensis</i>	redbud	High	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Cercis canadensis 'Ace of Hearts'</i>	redbud, Ace of Hearts	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Cercis canadensis 'Appalachian Red'</i>	redbud, Appalachian Red	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	White

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Cercis canadensis</i> 'Covey'	redbud, Covey weeping	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Cercis canadensis</i> 'Forest Pansey'	redbud, Forest Pansey	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Cercis canadensis</i> 'JN2'	redbud, The Rising Sun	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Red
<i>Cercis canadensis</i> 'Pink Heartbreaker'	redbud, Pink Heartbreaker	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Cercis canadensis</i> 'Ruby Falls Falls'	redbud, Ruby Falls Weeping	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Cercis canadensis</i> 'Vanilla Twist'	redbud, Vanilla Twist	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Purple Pink
<i>Chamaecyparis lawsoniana</i> 'Pinpoint Gold'	falsecypress, Pinpoint Gold	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	North America	No	Evergreen Conifer	Early Spring	Red
<i>Chamedaphne calyculata</i>	leatherleaf	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Chionanthus virginicus</i>	white fringe tree	Medium	Moderately Tolerant	Upland	Intolerant	Moderately Sensitive	Undetermined	Small Tree	No	North America	No	Deciduous Broadleaf	Early Spring	White
<i>Cladrastis kentukea</i>	yellowwood, American	Low	Moderately Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Clethra alnifolia</i>	summersweet	Medium	Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Early Summer	White
<i>Comptonia peregrina</i>	sweet-fern	High	Partially Tolerant	Upland	Tolerant	Intolerant	Tolerant	Shrub	No	Indiana	No	Deciduous Broadleaf	Summer	White
<i>Cornus alternifolia</i>	dogwood, pagoda	Low	Tolerant	Upland	Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Cornus amomum</i>	dogwood, silky	High	Moderately Tolerant	Lowland	Sensitive	Moderately Tolerant	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Yellow White
<i>Cornus drummondii</i>	dogwood, roughleaf	High	Tolerant	Upland	Tolerant	Moderately Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Cornus florida</i>	dogwood, flowering	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Yellow White
<i>Cornus florida</i> 'Cherokee Chief'	dogwood, Cherokee Chief	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Cornus florida</i> 'Cherokee Princess'	dogwood, Cherokee Princess	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Spring	Red
<i>Cornus florida</i> 'Cloud Nine'	dogwood, Cloud Nine flowering	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Red White
<i>Cornus florida</i> 'Comco No. 1'	dogwood, Cherokee Brave	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Cornus florida</i> 'Kay's Appalachian Mist'	dogwood, Kay's Appalachian Mist	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Red
<i>Cornus kousa</i>	dogwood, Kousa	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Cornus kousa chinensis</i>	dogwood, Chinese	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Early Summer	White
<i>Cornus kousa</i> 'Gallean'	dogwood, Gallean	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Early Summer	Green
<i>Cornus kousa</i> 'Heartthrob'	dogwood, Heartthrob	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Late Spring	White
<i>Cornus kousa</i> 'National'	dogwood, National kousa	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Late Spring	Pink
<i>Cornus kousa</i> 'Radiant Rose'	dogwood, Radiant Rose	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Cornus kousa</i> 'Scarlet Fire'	dogwood, Scarlet Fire'	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Late Spring	Pink

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Cornus kousa</i> 'Snow Tower'	dogwood, Snow Tower	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Early Spring	Pink
<i>Cornus mas</i>	dogwood, cornelian cherry	Medium	Partially Tolerant	Undetermined	Tolerant	Moderately Tolerant	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Late Spring	White
<i>Cornus mas</i> 'Golden Glory'	dogwood, Golden Glory	Medium	Partially Tolerant	Undetermined	Tolerant	Moderately Tolerant	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Late Winter	Yellow
<i>Cornus obliqua</i>	dogwood, blue fruited	Medium	Intolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Winter	Yellow
<i>Cornus racemosa</i>	dogwood, grey	High	Moderately Tolerant	Upland	Moderately Tolerant	Moderately Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Cornus rugosa</i>	dogwood, roundleaf	High	Partially Tolerant	Upland	Moderately Tolerant	Sensitive	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Cornus sericea</i>	dogwood, red twig	Medium	Partially Tolerant	Lowland	Tolerant	Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Cornus x 'Rutcan'</i>	dogwood, Constellation	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Cornus x 'Rutdan'</i>	dogwood, Celestial	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Cornus x 'Rutgan'</i>	dogwood, Stellar Pink	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White Pink
<i>Cornus x 'Rutlan' RUTH ELLEN</i>	dogwood, Ruth Ellen	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Pink
<i>Corylus americana</i>	hazelnut	Medium	Moderately Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Shrub	Yes	Indiana	Yes	Deciduous Broadleaf	Late Spring	White
<i>Cotinus coggygria</i>	smokebush	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Red
<i>Cotinus coggygria</i> 'Royal Purple'	smokebush, Royal Purple	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Summer	Pink
<i>Cotinus obovatus</i>	smoketree, American	High	Partially Tolerant	Upland	Tolerant	Sensitive	Undetermined	Small Tree	Yes	North America	No	Deciduous Broadleaf	Summer	Pink
<i>Crataegus ambigua</i>	hawthorn, Russian	Low	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Summer	Pink
<i>Crataegus crus-galli</i>	hawthorn, cockspur	Medium	Moderately Tolerant	Lowland/ Upland	Moderately Tolerant	Sensitive	Some Tolerance	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Crataegus crus-galli</i> 'Cruzam'	hawthorn, Crusader cockspur	Medium	Moderately Tolerant	Lowland/ Upland	Moderately Tolerant	Sensitive	Some Tolerance	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Crataegus crus-galli</i> var. <i>inermis</i>	hawthorn, thornless cockspur	Medium	Moderately Tolerant	Lowland/ Upland	Moderately Tolerant	Sensitive	Some Tolerance	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Crataegus mollis</i>	hawthorn, downy	Medium	Moderately Tolerant	Upland	Moderately Tolerant	Sensitive	Undetermined	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Crataegus phaenopyrum</i>	hawthorn, Washington	Medium	Partially Tolerant	Lowland	Moderately Sensitive	Sensitive	Some Tolerance	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Crataegus viridis</i> 'Winter King'	hawthorn, Winter King	Medium	Tolerant	Lowland	Tolerant	Sensitive	Some Tolerance	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Cryptomeria japonica</i> 'Yoshino'	cedar, Yoshino Japanese	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Undetermined	Large Tree	No	No	No	Evergreen Conifer	Late Spring	White
<i>Cydonia oblonga</i>	quince	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Non-Flowering	Non-Flowering
<i>Dasiphora fruticosa</i> ( <i>Potentilla</i> )	cinquefoil, shrubby	Medium	Partially Tolerant	Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Pink
<i>Diervilla lonicera</i>	northern bush honeysuckle	Medium	Tolerant	Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Summer	Yellow
<i>Diospyros virginiana</i>	persimmon	High	Partially Tolerant	Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	large Tree	Yes	Indiana	Yes, need male/female	Deciduous Broadleaf	Summer	Yellow
<i>Euonymus americanus</i>	American strawberry bush	Low	Tolerant	Lowland/ Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Euonymus atropurpureus</i>	eastern wahoo	Low	Partially Tolerant	Lowland/Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Ficus carica 'Brown Turkey'</i>	fig, Brown Turkey	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Ficus carica 'Chicago Hardy'</i>	fig, Chicago Hardy	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	Yellow
<i>Forsythia x intermedia</i>	forsythia, Lynwood Gold	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Deciduous Broadleaf	Early Spring	Yellow
<i>Forsythia x intermedia 'Spring Glory'</i>	forsythia, Spring Glory	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Deciduous Broadleaf	Early Summer	White
<i>Franklinia alatamaha</i>	Franklin tree	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Summer	White
<i>Gaultheria procumbens</i>	wintergreen	Low	Moderately Tolerant	Lowland/Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Evergreen Broadleaf	Early Summer	Pink
<i>Gaylussacia baccata</i>	huckleberry, black	Medium	Tolerant	Lowland/Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ginkgo biloba</i>	ginkgo	High	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	Yes, need female	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ginkgo biloba 'Autumn Gold'</i>	ginkgo, Autumn Gold	High	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	Yes, need female	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ginkgo biloba 'Princeton Sentry'</i>	ginkgo, Princeton Sentry	High	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	Yes, need female	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ginkgo biloba 'Magyar'</i>	ginkgo, Magyar	High	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	Yes, need female	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ginkgo biloba 'The President'</i>	ginkgo, The President	High	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	Yes, need female	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Gleditsia triacanthos inermis</i>	honeylocust, thornless	Medium	Intolerant	Lowland/Upland	Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Gleditsia triacanthos inermis 'Harve'</i>	honeylocust, Northern Acclaim	Medium	Intolerant	Lowland/Upland	Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Gleditsia triacanthos inermis 'Impcole'</i>	honeylocust, Imperial	Medium	Intolerant	Lowland/Upland	Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Gleditsia triacanthos inermis 'Shademaster'</i>	honeylocust, Shademaster	Medium	Intolerant	Lowland/Upland	Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Gleditsia triacanthos inermis 'Suncole'</i>	honeylocust, Sunburst	Medium	Intolerant	Lowland/Upland	Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Gleditsia triacanthos 'Skycole'</i>	honeylocust, Skyline	Medium	Intolerant	Lowland/Upland	Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Gymnocladus dioicus</i>	Kentucky coffeetree	High	Partially Tolerant	Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Greenish White
<i>Gymnocladus dioicus 'McKBranded'</i>	Kentucky coffeetree, Decaf	High	Partially Tolerant	Upland	Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Gymnocladus dioicus 'Espresso'</i>	Kentucky coffeetree, Espresso	High	Partially Tolerant	Upland	Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Winter	Yellow
<i>Hamamelis vernalis</i>	witchhazel, vernal	Medium	Moderately Tolerant	Upland	Tolerant	Tolerant	Undetermined	Shrub/Small Tree	No	North America	No	Deciduous Broadleaf	Late Winter	Yellow
<i>Hamamelis virginiana</i>	witchhazel, common	Medium	Moderately Tolerant	Upland	Moderately Sensitive	Moderately Sensitive	Sensitive	Shrub/Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Heptacodium miconioides</i>	Seven-son flower	Low	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Summer	White
<i>Hydrangea arborenszens</i>	hydrangea, smooth	Medium	Tolerant	Lowland/Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Summer	White
<i>Hydrangea paniculata</i>	hydrangea, paniced	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Hydrangea quercifolia</i>	hydrangea, oakleaf	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Yellow

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Hypericum kalmianum</i>	St. John's wort, Kalm's	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Evergreen Broadleaf	Summer	Yellow
<i>Hypericum prolificum</i>	St. John's wort, shrubby	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Ilex glabra 'Stongbox'</i>	inkberry, Strongbox	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	North America	No	Evergreen Broadleaf	Spring	Inconspicuous
<i>Ilex verticillata</i>	winterberry	High	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Non-Flowering	Non-Flowering
<i>Juniperus chinensis 'Blue Point'</i>	juniper, blue point	Low	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus chinensis 'Fairview'</i>	juniper, fairview	Low	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus chinensis 'Hetzii'</i>	juniper, columnar	Low	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus chinensis 'Keteleeri'</i>	juniper, Keteleeri	Low	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus chinensis 'Mountbatten'</i>	juniper, Mountbatten	Low	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus chinensis 'Spartan'</i>	juniper, spartan	Low	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus communis</i>	juniper, common	Medium	Intolerant	Lowland	Tolerant	Moderately Sensitive	Some Tolerance	Shrub/Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus horizontalis</i>	juniper, creeping	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Some Tolerance	Shrub	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus virginiana</i>	red cedar, eastern	High	Intolerant	Upland	Tolerant	Sensitive	Some Tolerance	Large Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus virginiana 'Cupressifolia'</i>	juniper, Hillspire	High	Intolerant	Upland	Tolerant	Sensitive	Some Tolerance	Large Tree	no	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Juniperus virginiana 'Taylor'</i>	juniper, Taylor	High	Intolerant	Upland	Tolerant	Sensitive	Some Tolerance	Small Tree	no	Indiana	No	Evergreen Conifer	Late Summer	Yellow
<i>Koelreuteria paniculata</i>	golden rain tree	Low	Partially Tolerant	Undetermined	Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Non-Flowering
<i>Larix laricina</i>	larch, American	Low	Intolerant	Lowland/ Upland	Moderately Sensitive	Sensitive	Some Tolerance	Large Tree	No	Indiana	No	Deciduous Conifer	Early Spring	Yellow
<i>Lindera benzoin</i>	spicebush	High	Tolerant	Lowland/ Upland	Sensitive	Moderately Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Liquidambar styraciflua</i>	sweetgum, American	High	Intolerant	Lowland/ Upland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Liquidambar styraciflua 'Happdell'</i>	sweetgum, Happidaze	High	Intolerant	Lowland/ Upland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Liquidambar styraciflua 'Moraine'</i>	sweetgum, Moraine	High	Intolerant	Lowland/ Upland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Liquidambar styraciflua 'Slender Silhouette'</i>	sweetgum, Slender Silhouette	High	Intolerant	Lowland/ Upland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Yellow Green
<i>Liquidambar styraciflua 'Worplesdon'</i>	sweetgum, Worplesdon	High	Intolerant	Lowland/ Upland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Yellow Green
<i>Liriodendron tulipifera</i>	tuliptree	High	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Orange
<i>Liriodendron tulipifera 'JFS-Oz'</i>	tuliptree, Emerald City	High	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Lonicera dioica</i>	honeysuckle, limber	Medium	Tolerant	Upland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Red
<i>Lonicera reticulata</i>	honeysuckle, yellow	Medium	Tolerant	Upland	Undetermined	Undetermined	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Maclura pomifera 'White Shield'</i>	osage-orange, White Shield	Medium	Partially Tolerant	Upland	Tolerant	Tolerant	Some Tolerance	Large Tree	Yes	North America	No	Deciduous Broadleaf	Late Spring	Greenish Yellow



# Expanding and Stewardship Regional Forest Canopy through the Northwest (NW) Indiana Tree Planting Consortium.



Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Magnolia acuminata</i>	magnolia, cucumber	Medium	Moderately Tolerant	Upland	Sensitive	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	White Purple
<i>Magnolia macrophylla</i>	magnolia, big leaf	Low	Moderately Tolerant	Upland	Sensitive	Moderately Tolerant	Undetermined	Large Tree	No	North America	No	Deciduous Broadleaf	Early Spring	White
<i>Magnolia stellata</i>	magnolia, star	Medium	Moderately Tolerant	Undetermined	Sensitive	Moderately Tolerant	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White Pink
<i>Magnolia stellata 'Centennial'</i>	magnolia, Centennial Star	Medium	Moderately Tolerant	Undetermined	Sensitive	Moderately Tolerant	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Magnolia stellata 'Royal Star'</i>	magnolia, Royal Star	Medium	Moderately Tolerant	Undetermined	Sensitive	Moderately Tolerant	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Magnolia tripetala</i>	magnolia, umbrella	Low	Moderately Tolerant	Upland	Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Magnolia virginiana</i>	magnolia, sweetbay	High	Moderately Tolerant	Lowland	Sensitive	Tolerant	Undetermined	Small Tree	Yes	North America	No	Deciduous Broadleaf	Late Spring	Purple
<i>Magnolia x 'Ann'</i>	magnolia, Ann	Low	Moderately Tolerant	Undetermined	Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Purple
<i>Magnolia x 'Betty'</i>	magnolia, Betty	Low	Moderately Tolerant	Undetermined	Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Purple
<i>Magnolia x 'Jane'</i>	magnolia, Jane	Low	Moderately Tolerant	Undetermined	Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Pink
<i>Magnolia x loebneri 'Leonard Messel'</i>	magnolia, Leonard Messel	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White Purple
<i>Magnolia x soulangeana</i>	magnolia, saucer	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Summer	White Pink
<i>Malus coronaria</i>	crabapple, sweet	Medium	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Gala'</i>	apple, Gala	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Golden Delicious'</i>	apple, Golden Delicious	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Granny Smith'</i>	apple, Granny Smith	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Honeycrisp'</i>	apple, Honeycrisp	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Macintosh'</i>	apple, Macintosh	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Pink Lady'</i>	apple, Pink Lady	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Malus domestica 'Red Delicious'</i>	apple, Red Delicious	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Late Spring	Red
<i>Malus hupehensis 'Cardinal'</i>	crabapple, Cardinal	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Summer	White
<i>Malus ioensis</i>	crabapple, prairie	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	White
<i>Malus sargentii</i>	crabapple, Sargent's	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus sargentii 'Tina'</i>	crabapple, Tina Sargent	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Pink
<i>Malus x 'Adams'</i>	crabapple, Adams	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus x 'Jeffite'</i>	crabapple, Starlite	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus x 'Lanzam'</i>	crabapple, Lancelot	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'Perfect Purple'</i>	crabapple, Perfect Purple	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Red



Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Malus x 'Red Barron'</i>	crabapple, Red Barron	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus x 'Red Jade'</i>	crabapple, Red Jade	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus x 'Red Jewel'</i>	crabapple, Red Jewel	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Red
<i>Malus x 'Shotizam'</i>	crabapple, Showtime	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	White
<i>Malus x 'Spring Snow'</i>	crabapple, Spring Snow	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'Sutyzam'</i>	crabapple, Sugar Tyme	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Malus x 'Adirondack'</i>	crabapple, flowering	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Pink
<i>Malus x adstringens 'Durleo'</i>	crabapple, Gladiator	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'Coralcole'</i>	crabapple, Coralburst	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus x 'Donald Wyman'</i>	crabapple, Donald Wyman	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	White
<i>Malus x 'Golden Raindrops'</i>	crabapple, flowering	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'JFS KW139MX'</i>	crabapple, Ruby Dayze	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	no	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'JFS KW213MX'</i>	crabapple, Raspberry Spear	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	no	No	No	Deciduous Broadleaf	Spring	White
<i>Malus x 'JFS KW214MX'</i>	crabapple, Ivory Spear	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	White
<i>Malus x 'JFS-KW207'</i>	crabapple, Sparkling Sprite	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	White
<i>Malus x 'Lollizam'</i>	crabapple, Lollipop	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'Parsi'</i>	crabapple, Pink Princess	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Pink
<i>Malus x 'Prairie Rose'</i>	crabapple, Prairie Rose	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Red
<i>Malus x 'Prairiefire'</i>	crabapple, flowering	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Red
<i>Malus x 'Purple Prince'</i>	crabapple, Purple Prince	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Spring	Red
<i>Malus x 'Royal Beauty'</i>	crabapple, Royal Beauty	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Early Spring	Pink
<i>Malus x 'Royal Raindrops'</i>	crabapple, Royal Raindrops	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Malus x 'Snowdrift'</i>	crabapple, Snowdrift	Medium	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	No	No	No	Deciduous Broadleaf	Non-Flowering	Non-Flowering
<i>Metasequoia glyptostroboides</i>	dawn redwood	Medium	Moderately Tolerant	Lowland	Moderately Tolerant	Sensitive	Undetermined	Large Tree	Yes	No	No	Deciduous Conifer	Non-Flowering	Non-Flowering
<i>Metasequoia glyptostroboides 'Gold Rush'</i>	dawn redwood, Gold Rush	Low	Moderately Tolerant	Lowland	Moderately Tolerant	Sensitive	Undetermined	Large Tree	Yes	No	No	Deciduous Conifer	Early Spring	Inconspicuous
<i>Morus rubra</i>	mulberry, red	Low	Partially Tolerant	Lowland	Moderately Tolerant	Sensitive	Undetermined	Large Tree	No	Indiana	Yes	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Myrica gale</i>	sweetgale	Low	Partially Tolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Myrica pensylvanica</i>	bayberry	High	Intolerant	Upland	Undetermined	Undetermined	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Early Spring	White



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Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Neviusia alabamensis</i>	Alabama snow wreath	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Nyssa sylvatica</i>	black gum	High	Moderately Tolerant	Lowland/Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Nyssa sylvatica</i> 'David Odom'	black gum, Afterburner	High	Moderately Tolerant	Lowland/Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Nyssa sylvatica</i> 'Green Gable'	black gum, Green Gable	High	Moderately Tolerant	Lowland/Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Nyssa sylvatica</i> 'JFS-Red'	black gum, Firestarter	High	Moderately Tolerant	Lowland/Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Nyssa sylvatica</i> 'Northern Splendor'	black gum, Northern Splendor	High	Moderately Tolerant	Lowland/Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Nyssa sylvatica</i> 'Wildfire'	black gum, Wildfire	High	Moderately Tolerant	Lowland/Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Ostrya virginiana</i>	hop hornbeam	High	Partially Tolerant	Upland	Moderately Tolerant	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Summer	White
<i>Oxydendrum arboreum</i>	sourwood	Low	Partially Tolerant	Upland	Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Physocarpus opulifolius</i>	ninebark, common	High	Tolerant	Lowland	Moderately Tolerant	Tolerant	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Non-Flowering	Non-Flowering
<i>Picea abies</i>	spruce, Norway	Low	Tolerant	Upland	Moderately Sensitive	Moderately Sensitive	Undetermined	Large Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea abies</i> 'Cupressina'	spruce, columnar Norway	Low	Intolerant	Upland	Undetermined	Undetermined	Undetermined	Large Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea glauca</i>	spruce, white	Low	Tolerant	Upland	Moderately Sensitive	Sensitive	Some Tolerance	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea glauca</i> var. <i>densata</i>	spruce, black hills	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Some Tolerance	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea pungens</i>	spruce, Colorado blue	Low	Tolerant	Upland	Moderately Tolerant	Sensitive	Some Tolerance	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea pungens</i> 'Baby Blue Eyes'	spruce, Baby Blue Eyes	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Some Tolerance	Shrub/Small Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea pungens</i> 'Fat Albert'	spruce, Fat Albert	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Some Tolerance	Shrub/Small Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Picea pungens</i> 'Hoopsii'	spruce, Hoopsii	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Some Tolerance	Large Tree	No	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Pinus banksiana</i>	pine, jack	Low	Intolerant	Lowland	Moderately Sensitive	Moderately Sensitive	Tolerant	Large Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Pinus nigra</i>	pine, Austrian	Low	Partially Tolerant	Undetermined	Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Pinus ponderosa</i>	pine, ponderosa	Low	Partially Tolerant	Undetermined	Tolerant	Sensitive	Some Tolerance	Large Tree	Yes	North America	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Pinus resinosa</i>	pine, red	Low	Intolerant	Upland	Undetermined	Undetermined	Sensitive	Large Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Pinus strobus</i>	pine, eastern white	Low	Moderately Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Pinus virginiana</i>	pine, Virginia	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	No	Indiana	No	Evergreen Conifer	Late Spring	Inconspicuous
<i>Platanus occidentalis</i>	sycamore, American	High	Moderately Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Platanus x acerifolia</i>	London planetree	High	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Platanus x acerifolia</i> 'Bloodgood'	London planetree, Bloodgood	High	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Platanus x acerifolia</i> 'Morton Euclid'	London planetree, Ovation	High	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Platanus x acerifolia</i> 'Morton Circle'	London planetree, Exclamation	High	Moderately Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Populus balsamifera</i>	poplar, balsam	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Populus deltoides</i>	cottonwood, eastern	Medium	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Populus grandidentata</i>	aspen, bigtooth	Low	Intolerant	Upland	Undetermined	Undetermined	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Late Winter	Inconspicuous
<i>Populus tremuloides</i>	aspen, quaking	Low	Partially Tolerant	Upland	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Populus tremuloides</i> 'JFS-Column'	aspen, Mountain Sentinel	Low	Partially Tolerant	Upland	Undetermined	Undetermined	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	White
<i>Prunus americana</i>	plum, American	Medium	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Small Tree	Yes	Indiana	Yes	Deciduous Broadleaf	Early Spring	White
<i>Prunus armeniaca</i> 'Moorpark'	apricot, Moorpark	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Prunus armeniaca</i> 'Tilton'	apricot, Tilton	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	Pink
<i>Prunus cerasifera</i>	plum, Newport flowering	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	No	Yes	Deciduous Broadleaf	Early Spring	Pink
<i>Prunus cerasifera</i> 'Cripoizam'	plum, Crimson Pointe	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Pink
<i>Prunus cerasifera</i> 'Thundercloud'	plum, Thundercloud purple leaf	Low	Intolerant	Undetermined	Tolerant	Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	White
<i>Prunus domestica</i> 'Stanley'	plum, Stanley	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Prunus hotulana</i>	plum, goose	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	White
<i>Prunus incisa</i> 'Little Twist'	cherry, Little Twist	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	White
<i>Prunus insititia</i>	plum, Damson	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Spring	Inconspicuous
<i>Prunus maritima</i>	plum, beach	Low	Intolerant	Undetermined	Undetermined	Undetermined	Tolerant	Shrub	No	North America	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Prunus pennsylvanica</i>	cherry, pin	Low	Partially Tolerant	Undetermined	Tolerant	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	White
<i>Prunus persica</i> 'Contender'	peach, Contender	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Prunus persica</i> 'Reliance'	peach, Reliance	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Prunus pumila</i>	cherry, eastern sand	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Prunus serotina</i>	cherry, black	Low	Partially Tolerant	Lowland/ Upland	Moderately Sensitive	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Prunus subhirtella</i> 'Pendula Plena Rosea'	cherry, Double Pink Weeping Higan	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	Pink
<i>Prunus virginiana</i>	chokecherry	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	White
<i>Prunus virginiana</i> 'Canada Red'	chokecherry, Canada Red	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Prunus virginiana</i> 'Sucker Punch'	chokecherry, Sucker Punch	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Prunus x 'Accolade'</i>	cherry, Accolade	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	White
<i>Prunus x cistena</i>	cherry, purple leaf sand	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	White

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Prunus x 'Pisnshzam'</i>	cherry, Pink Snow Showers	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Late Spring	White
<i>Prunus x 'Snofozam'</i>	cherry, Snow Fountains Weeping	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Pink
<i>Prunus x yedoensis</i>	cherry, Yoshino	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	White Pink
<i>Ptelea trifoliata</i>	hoptree (wafer ash)	High	Tolerant	Upland	Tolerant	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Pink
<i>Pyrus communis 'Comice'</i>	pear, Comice	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White
<i>Pyrus communis 'Moonglow'</i>	pear, Moonglow	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	Yes	Deciduous Broadleaf	Early Spring	White Pink
<i>Quercus alba</i>	oak, white	Medium	Partially Tolerant	Lowland/Upland	Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Summer	Greenish White
<i>Quercus bicolor</i>	oak, swamp white	High	Partially Tolerant	Lowland	Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus bicolor 'Bonnie and Mike'</i>	oak, Beacon	Low	Partially Tolerant	Lowland	Undetermined	Undetermined	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus bicolor 'JFS-KW12'</i>	oak, American Dream	Low	Partially Tolerant	Lowland	Undetermined	Undetermined	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus lyrata</i>	oak, overcup	High	Partially Tolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus macrocarpa</i>	oak, bur	High	Partially Tolerant	Upland	Tolerant	Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Quercus michauxii</i>	oak, swamp chestnut	High	Partially Tolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus muehlenbergii</i>	oak, chinkapin	High	Partially Tolerant	Upland	Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus prinoides</i>	oak, dwarf chinkapin	Low	Tolerant	Upland	Tolerant	Sensitive	Undetermined	Shrub/Small Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus prinus (montana)</i>	oak, chestnut	Medium	Partially Tolerant	Upland	Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus robur 'Fastigiata'</i>	oak, Pyramidal English	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus robur x alba</i>	oak, Crimson Spire	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus robur x bicolor 'Nadler'</i>	oak, Kindred Spirit	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Some Tolerance	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus stellata</i>	oak, post	Medium	Partially Tolerant	Upland	Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus x macdanielii 'Clemons'</i>	oak, Heritage	Low	Partially Tolerant	Undetermined	Tolerant	Sensitive	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus x schuettei</i>	oak, Schuette's	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Quercus x warei 'Long'</i>	oak, Regal Prince	Medium	Partially Tolerant	Undetermined	Tolerant	Moderately Tolerant	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Rhus aromatica</i>	sumac, fragrant	High	Partially Tolerant	Lowland/Upland	Tolerant	Sensitive	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Rhus copallinum</i>	sumac, shining	Medium	Intolerant	Upland	Tolerant	Sensitive	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Spring	Yellow
<i>Rhus glabra</i>	sumac, smooth	Medium	Partially Tolerant	Upland	Tolerant	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Summer	Yellow
<i>Rhus typhina</i>	sumac, staghorn	Medium	Intolerant	Upland	Moderately Tolerant	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Summer	Greenish Yellow
<i>Ribes americanum</i>	currant, American black	Medium	Moderately Tolerant	Undetermined	Sensitive	Tolerant	Undetermined	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Early Summer	Greenish Yellow

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Ribes aureum</i>	currant, golden	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	North America	Yes	Deciduous Broadleaf	Late Spring	White
<i>Ribes missouriense</i>	gooseberry, wild	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	Yellow
<i>Rosa blanda</i>	rose, early wild	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Rosa carolina</i>	rose, pasture	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Pink
<i>Rosa palustris</i>	rose, swamp	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Pink
<i>Rosa setigera</i>	rose, Illinois	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Pink
<i>Rosa woodsii</i>	rose, wood's	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	North America	No	Deciduous Broadleaf	Early Summer	Pink
<i>Rubus occidentalis</i>	raspberry, black	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Pink
<i>Rubus odoratus</i>	raspberry, purple flowering	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Summer	White
<i>Salix alba</i>	willow, white	Low	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	No	No	No	Deciduous Broadleaf	Early Summer	Purple
<i>Salix alba 'Tristis'</i>	willow, Golden Niobe Weeping	Low	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	No	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Salix amygdaloides</i>	willow, peachleaf	Medium	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Salix bebbiana</i>	willow, Bebb's	Medium	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	No	North America	No	Deciduous Broadleaf	Early Summer	Inconspicuous
<i>Salix cordata</i>	willow, dune	Medium	Intolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Salix discolor</i>	willow, pussy	Medium	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Shrub/Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Salix humilis</i>	willow, prairie	Medium	Intolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Salix interior</i>	willow, sandbar	Medium	Intolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Salix myricoides</i>	willow, blueleaf	Medium	Intolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Salix nigra</i>	willow, black	Medium	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Salix petiolaris</i>	willow, meadow	Medium	Intolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub/Small Tree	No	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Salix sericea</i>	willow, silky	Medium	Intolerant	Lowland	Sensitive	Tolerant	Undetermined	Large Tree	No	Indiana	No	Deciduous Broadleaf	Spring	Inconspicuous
<i>Salix serissima</i>	willow, autumn	Medium	Intolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Sambucus canadensis</i>	elderberry	High	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	Inconspicuous
<i>Sambucus racemosa</i>	elderberry, red	Medium	Moderately Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Late Summer	White
<i>Sassafras albidum</i>	sassafras	Low	Moderately Tolerant	Upland	Tolerant	Moderately Sensitive	Undetermined	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Summer	Red
<i>Sorbus americana</i>	mountain-ash, American	Low	Partially Tolerant	Upland	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	North America	No	Deciduous Broadleaf	Late Spring	Greenish Yellow
<i>Sorbus decora</i>	mountain-ash, showy	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Sensitive	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Late Spring	White
<i>Spiraea alba</i>	meadowsweet	High	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Spring	White

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Spiraea tomentosa</i>	steepleshub	High	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Summer	White
<i>Staphylea trifolia</i>	bladdernut	High	Tolerant	Lowland	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Late Summer	Pink
<i>Styrax americanus</i>	snowbell	Low	Moderately Tolerant	Lowland	Undetermined	Undetermined	Undetermined	Small Tree	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Styrax japonicus 'Snowcone'</i>	snowbell, Snowcone Japanese	Low	Partially Tolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Undetermined	Small Tree	No	No	No	Deciduous Broadleaf	Spring	White
<i>Symphoricarpos albus</i>	common snowberry	High	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	White
<i>Symphoricarpos orbiculatus</i>	coralberry	High	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	Indiana	No	Deciduous Broadleaf	Early Summer	Pink
<i>Syringa meyeri 'Palibin'</i>	lilac, Dwarf Korean	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Syringa pekinensis 'Morton'</i>	lilac, China Snow	Low	Intolerant	Undetermined	Tolerant	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Pink
<i>Syringa pubescens subs. Patula 'Miss Kim'</i>	lilac, Miss Kim	Low	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Deciduous Broadleaf	Early Summer	White Yellow
<i>Syringa reticulata</i>	lilac, Japanese tree	Low	Intolerant	Undetermined	Tolerant	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Lavender Blue
<i>Syringa reticulata 'Bailnce'</i>	lilac, Snowdance Japanese tree	Low	Intolerant	Undetermined	Tolerant	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	White
<i>Syringa reticulata 'Ivory Silk'</i>	lilac, Ivory Silk Japanese tree	Low	Intolerant	Undetermined	Tolerant	Moderately Sensitive	Undetermined	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	White
<i>Syringa vulgaris</i>	lilac, common	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Shrub/Small Tree	No	No	No	Deciduous Broadleaf	Early Summer	White
<i>Taxodium distichum</i>	bald cypress, common	High	Partially Tolerant	Lowland	Moderately Sensitive	Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Conifer	Early Summer	Violet
<i>Taxodium distichum 'Mickelson'</i>	bald cypress, Shawnee Brave	High	Partially Tolerant	Lowland	Moderately Sensitive	Tolerant	Some Tolerance	Large Tree	Yes	Indiana	No	Deciduous Conifer	Non-Flowering	Non-Flowering
<i>Taxus cuspidata 'Adams'</i>	yew, Adam's	Low	Moderately Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus cuspidata 'Adams'</i>	yew, Adams Japanese	Low	Moderately Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Shrub/Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus cuspidata 'Capitata'</i>	yew, Japanese	Low	Moderately Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus cuspidata 'Capitata'</i>	yew, Japanese	Low	Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Shrub/Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus x media 'Brownii'</i>	yew, Brown's	Low	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus x media 'Densiformis'</i>	yew, Densiformis	Low	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus x media 'Fairview'</i>	yew, Fairview	Low	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus x media 'Hicksii'</i>	yew, Hicks	Low	Tolerant	Undetermined	Sensitive	Sensitive	Undetermined	Shrub/Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus x media 'Hicksii'</i>	yew, Hicks	Low	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Taxus x media 'Wardii'</i>	yew, Ward's	Low	Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Shrub	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i>	arborvitae	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Large Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis 'Bailjohn'</i>	arborvitae, Technito First Editions	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis 'Brabant'</i>	arborvitae, Brabant	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Thuja occidentalis</i> 'Degroot's Spire'	aborvitae, Degroot's Spire	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Elegantissima'	aborvitae, Elegantissima	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Fairview'	arborvitae, Fairview	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Hetz Wintergreen'	aborvitae, Hetz Wintergreen	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Holmstrup'	aborvitae, Holmstrup	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Nigra'	arborvitae, Dark Green	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Pyramidal'	arborvitae, Pyramidal	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Smaragd'	arborvitae, Emerald Green	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja occidentalis</i> 'Techny'	arborvitae, Techny	Medium	Tolerant	Lowland/Upland	Moderately Tolerant	Moderately Sensitive	Undetermined	Small Tree	No	Indiana	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja standishii</i> x <i>plicata</i> 'Green Giant'	arborvitae, Green Giant	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Large Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Thuja</i> x ' <i>Steeplechase</i> '	aborvitae, Steeplechase	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Small Tree	No	No	No	Evergreen Conifer	Non-Flowering	Non-Flowering
<i>Tilia americana</i>	basswood	High	Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Non-Flowering	Non-Flowering
<i>Tilia americana</i> 'McKsentry'	linden, American Sentry	High	Tolerant	Upland	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Yellow
<i>Tilia cordata</i> 'Greenspire'	linden, Greenspire	Medium	Tolerant	Undetermined	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	Yellow
<i>Tilia cordata</i> 'Halka'	linden, Summer Sprite	Medium	Intolerant	Undetermined	Moderately Sensitive	Moderately Sensitive	Sensitive	Small Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	Yellow
<i>Tilia cordata</i> 'Olympic'	linden, Olympic	Medium	Tolerant	Undetermined	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	Yellow
<i>Tilia flavescens</i> 'Glenleven'	linden, Glenleven	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Summer	Yellow
<i>Tilia tomentosa</i>	linden, silver	High	Moderately Tolerant	Undetermined	Moderately Tolerant	Sensitive	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Summer	Yellow
<i>Tilia tomentosa</i> 'Silver Lining'	linden, Silver Lining	High	Moderately Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Summer	Yellow
<i>Tilia tomentosa</i> 'Sterling'	linden, Sterling	High	Moderately Tolerant	Undetermined	Undetermined	Undetermined	Undetermined	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Summer	Yellow
<i>Tilia</i> x ' <i>Redmond</i> '	linden, Redmond	High	Tolerant	Undetermined	Moderately Sensitive	Sensitive	Sensitive	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Summer	Yellow
<i>Ulmus americana</i>	elm, American	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Sensitive	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Summer	Yellow
<i>Ulmus americana</i> 'Jefferson'	elm, Jefferson	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus americana</i> 'New Harmony'	elm, New Harmony	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus americana</i> 'Homestead'	elm, Homestead	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus americana</i> 'Prairie Expedition'	elm, Prairie Expedition	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus americana</i> 'Princeton'	elm, Princeton	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus americana</i> 'Valley Forge'	elm, Valley Forge	Low	Partially Tolerant	Lowland	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous

Species Name		Planting Frequency Recommendation	Environmental Tolerance					Usage Qualities						
Botanical	Common	Diversity Considerations	Shade	Native Habitat	Drought	Waterlogging	Salt Tolerant	Size	Street Tree	Native Species	Fruit Grove	Leaf type	Peak Flowering	Flower Color
<i>Ulmus parviflora</i> 'Allee'	elm, Allee Lacebark	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus Thomason</i>	elm, winged	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	Indiana	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus x 'Pioneer'</i>	elm, Pioneer	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus x 'Morton'</i>	elm, Accolade	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus x 'Morton Glossy'</i>	elm, Triumph	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus x 'Morton Stalwart'</i>	elm, Morton Stalwart	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus x 'New Horizon'</i>	elm, New Horizon	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Ulmus x 'Prospector'</i>	elm, Prospector	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Vaccinium angustifolium</i>	blueberry, lowbush	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Early Spring	Inconspicuous
<i>Vaccinium corymbosum</i>	blueberry, highbush	Medium	Intolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Vaccinium pallidum</i>	blueberry, hillside	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Viburnum acerifolium</i>	viburnum, maple leaf	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Viburnum carlesii</i>	viburnum, Korean spice	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	No	Yes	Deciduous Broadleaf	Spring	White
<i>Viburnum dentatum</i>	viburnum, arrowwood	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Viburnum lentago</i>	viburnum, nannyberry	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Viburnum nudum</i>	viburnum, witherod	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Viburnum opulus var. americanum</i>	viburnum, American cranberry bush	Medium	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Viburnum prunifolium</i>	viburnum, blackhaw	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub/Small Tree	No	Indiana	Yes	Deciduous Broadleaf	Spring	White
<i>Viburnum rafinesqueanum</i>	arrowwood, downy	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Viburnum trilobum</i>	viburnum, American cranberry bush	Medium	Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	Indiana	No	Deciduous Broadleaf	Spring	White
<i>Viburnum x burkwoodii</i>	viburnum, Burkwood	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	No	No	Deciduous Broadleaf	Spring	White
<i>Viburnum x juddii</i>	viburnum, Judd	Low	Partially Tolerant	Undetermined	Undetermined	Undetermined	Sensitive	Shrub	No	No	No	Deciduous Broadleaf	Spring	White
<i>Zelkova serrata</i> 'Green Vase'	zelkova, Green Vase	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Spring	White
<i>Acer campestre</i>	maple, hedge	Low	Moderately Tolerant	Upland/Lowland	Moderately Tolerant	Moderately Sensitive	Moderately Tolerant	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Zelkova serrata</i> 'JFS KW1'	zelkova, City Sprite	Low	Intolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Zelkova serrata</i> 'Musashino'	zelkova, Musashino	Low	Partially Tolerant	Undetermined	Moderately Tolerant	Sensitive	Moderately Tolerant	Large Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous
<i>Zelkova serrata</i> 'Schmidtlow'	zelkova, Wireless	Low	Intolerant	Undetermined	Moderately Tolerant	Moderately Tolerant	Moderately Tolerant	Small Tree	Yes	No	No	Deciduous Broadleaf	Late Spring	Inconspicuous



**PROHIBITED TREE SPECIES**

Botanical Name	Common Name	Reason	Details
<i>Acer platanoides</i>	Norway maple	Invasive	IISC Invasive Species List; High
<i>Ailanthus altissima</i>	tree of heaven	Invasive	IISC Invasive Species List; High; Prohibited Invasive Terrestrial Plants [312 IAC 18-3-25]
<i>Albizia julibrissin</i>	mimosa	Invasive	IISC Invasive Speices List; Medium
<i>Alnus glutinosa</i>	black alder	Invasive	IISC Invasive Species List; High; Prohibited Invasive Terrestrial Plants [312 IAC 18-3-25]
<i>Morus alba</i>	white mulberry	Invasive	IISC Invasive Species List; High; Prohibited Invasive Terrestrial Plants [312 IAC 18-3-25]
<i>Paulownia tomentosa</i>	princess tree	Invasive	IISC Invasive Speices List; Medium
<i>Phellodendron amurense</i>	Amur cork tree	Invasive	IISC Invasive Species List; High; Prohibited Invasive Terrestrial Plants [312 IAC 18-3-25]
<i>Pyrus calleryana</i>	callery pear	Invasive	IISC Invasive Species List; High
<i>Rhamnus cathartica</i>	buckthorn	Invasive	IISC Invasive Species List; High; Prohibited Invasive Terrestrial Plants [312 IAC 18-3-25]
<i>Quercus acutissima</i>	sawtooth oak	Invasive	IISC Invasive Species List; Caution
<i>Ulmus pumila</i>	Siberian elm	Invasive	IISC Invasive Speices List; Medium
<i>Fraxinus</i> spp.	ash species	Impacted	Emerald Ash Borer
<i>Castanea</i> spp.	chestnut species	Impacted	Oak Wilt and Chestnut Blight
<i>Quecus</i> spp. (lobatae)	northern red, black, pin, northern pin, scarlet, shumard, etc.	Impacted	Oak Wilt
<i>Tsuga canadensis</i>	eastern hemlock	Impacted	Hemlock Wooly Adelgid
<i>Ulmus americana</i>	American elm	Impacted	Dutch elm disease (American resistant cultivars reccomended as an alternative)
<i>Fagus grandifolia</i>	American beech	Impacted	Beech bark disease
<i>Juglans nigra</i>	black walnut	Aggressive	Fruit/leaves/roots kills other nearby trees and plants
<i>Robinia psuedoacacia</i>	black locust	Aggressive	species overwhelms other native tree

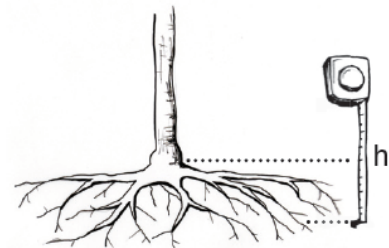
## APPENDIX II: TREE PLANTING GUIDES

### Planting Bare Root Trees

Planting bare root trees requires meticulous care from reception to installation. These steps ensure successful tree establishment and long-term growth.

- **Step 1: Receiving Tree for Planting (at tree storage area):**
  - Upon delivery, keep trees in a cool, shaded place.
  - If storing overnight, water packaging.
  - Fill a 5-gallon bucket halfway with water.
  - Remove the number of trees to be planted that day from packing materials.
  - Inspect the roots and gently untangle them.
  - Inspect the crowns and prune dead or damaged branches.
  - Place the tree in the water bucket.
  - If trees were packaged with sphagnum moss or other wet material, place it along the inside of the bucket to help stabilize the trees.
  - Plant trees within 6 hours of unpackaging.
- **Step 2: Prepare Hole (at tree planting location):**
  - Measure the root spread and root height (Figure 1).
  - Remove grass within a circular area 1.5 times as wide as the root spread.
  - Dig the hole to the depth of the highest fibrous root or trunk flare to the bottom of the longest root (Figure 2).
  - In clay soils, use a shovel to loosen the glazed walls of the planting hole.

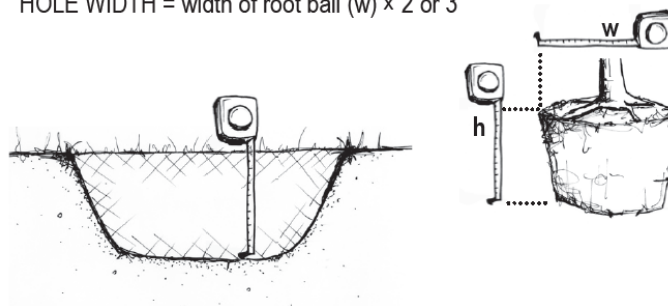
**Bare root**  
(roots spread out flat on the ground)



**Figure 12:** Measure the spread and height of the root ball. This is exactly how deep you should dig the hole. Measure the approximate width of the root ball or root system. Multiply this by 2, or if your soil is hard (clay or compacted), by at least 3. This is how wide you should dig the hole. Source: US Forest Service Tree Owner's Manual.

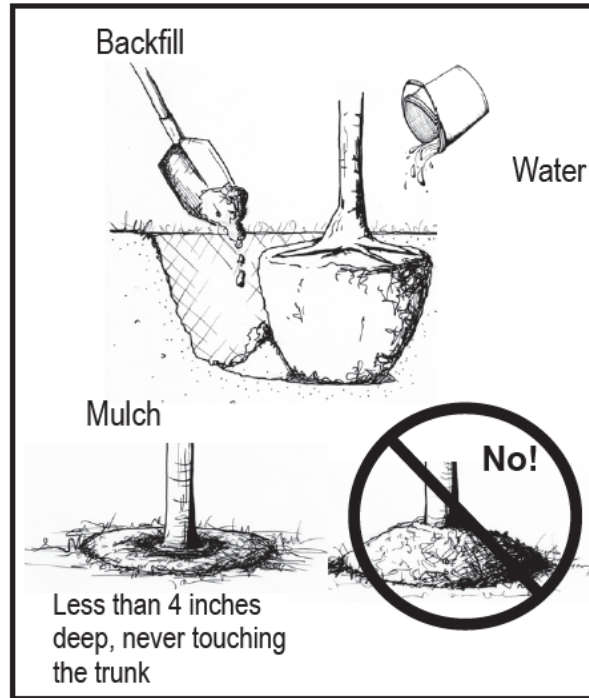
[www.treeownersmanual.info](http://www.treeownersmanual.info).

HOLE DEPTH = height of root ball (h)  
HOLE WIDTH = width of root ball (w) x 2 or 3



**Figure 2:** Dig the hole. The dimensions of the hole are very important in determining the survival of your tree. Dig the hole ONLY as deep as the root system (NO deeper!). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

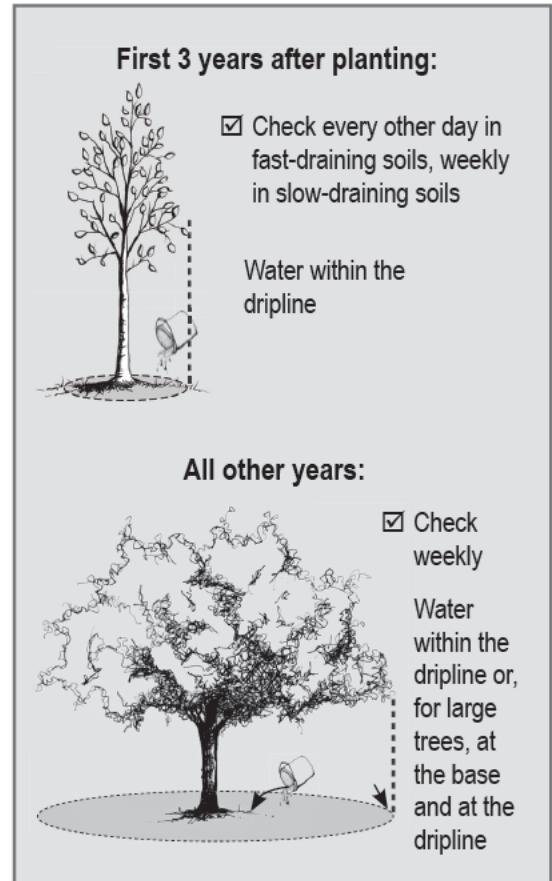
- Step 3: Place Tree in Hole:
  - Place the handle of the shovel across the center atop the hole.
  - Place the tree in the hole and against the center of the shovel handle so the tree is centered in the hole and roots are below the shovel and ground.
  - Align the highest fibrous root or trunk flare level or slightly above the bottom side of the handle so that this area of the tree is at or slightly above soil grade.
  - Look from all sides of the tree at the straightness of the tree in the hole and adjust the lean so the top of the tree is standing straight and up, not to one side.
  - Add backfill soil to the hole to secure the tree in place and remove the shovel from the top of the hole (Figure 3).



**Figure 3:** Make sure the trunk is straight. Put the original soil back in the hole, breaking up large clods, and working it in with your hands or a shovel. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Step 4: Fill Hole and Make Berm:
  - Add the remaining backfill soil around the roots, using your fingers to lightly but firmly tamp the soil. If the soil is dry, apply water after each layer is tamped.
  - Do not add soil amendments such as peat or bark. Do not use fertilizer, potting soil, or chemicals on your new trees.

- Biochar can be used to amend backfill soil during tree planting, following the label instructions.
- Build a berm 3 inches high and wide with the remaining soil, circling the inside edge of where grass was removed.
- **Step 5: Optional Tree Protection:**
  - Due to the typical size of these trees, rabbits and deer may pose a threat to the survivability of newly installed trees.
    - Make a 4-inch wide and 32-inch-tall wire cage to place around the tree.
    - Just before backfilling the planting hole, place the cage in the hole with the tree.
    - Plastic tree guards are also effective.
  - To discourage browsing of stem cambium by voles or mice or browsing of twigs and buds by rabbits or deer, apply a repellent following labeled directions.
- **Step 6: Water at Installation:**
  - Using low water pressure from a hose or bucket, apply water around the hole until the surrounding soil is thoroughly moist immediately following installation (Figure 4).



**Figure 4:** Tree roots need oxygen. Soil saturated with water for more than 24 hours can prevent roots from getting oxygen. Therefore, watering too much is as dangerous as watering too little (and is harder to correct). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- **Step 7: Mulch the Planting Hole:**
  - Mulch materials may be natural wood chips or shredded bark, needles, or leaves free of any extraneous material such as soil, stones, and debris.
  - Apply mulch 2-4 inches deep over the filled hole and berm, leaving 3 inches around the trunk clear from mulch (Figure 5).



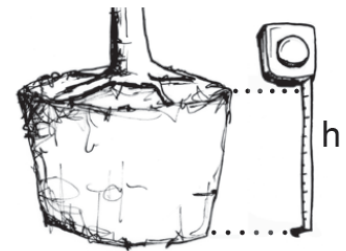
**Figure 5:** There should never be more than 4 inches of mulch over the roots. Too much mulch or soil can prevent oxygen from reaching the roots. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

## Planting Containerized Trees

Planting containerized trees requires meticulous care from reception to installation. These steps ensure successful tree establishment and long-term growth.

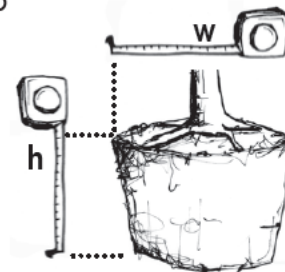
- Step 1: Receiving Tree for Planting (at tree storage area):
  - Upon delivery, keep trees in a cool, shaded place.
  - If storing overnight, water the soil medium in the container.
  - To avoid moisture loss, do not leave trees in direct sunlight for more than 4 hours.
- Step 2: Prepare Hole (at tree planting location):
  - Measure the width of the container and height of the soil in the container (Figure 1).
  - Remove grass within a circular area a minimum of 1.5 times as wide as the container.
  - Dig the hole to the depth of the height of the soil in the container (Figure 2).
  - In clay soils, use a shovel to loosen the glazed walls of the planting hole.

**Containerized**  
(excess soil removed)



**Figure 13:** Measure the spread and height of the root ball. This is exactly how deep you should dig the hole. Measure the approximate width of the root ball or root system. Multiply this by 2, or if your soil is hard (clay or compacted), by at least 3. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

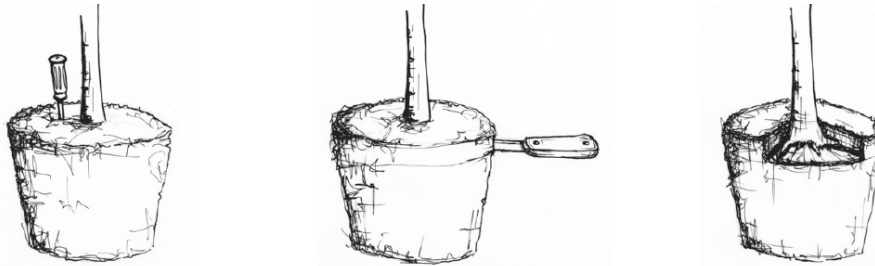
HOLE DEPTH = height of root ball (h)  
HOLE WIDTH = width of root ball (w) × 2 or 3



**Figure 14:** Dig the hole. The dimensions of the hole are very important in determining the survival of your tree. Dig the hole ONLY as deep as the root system (NO deeper!). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

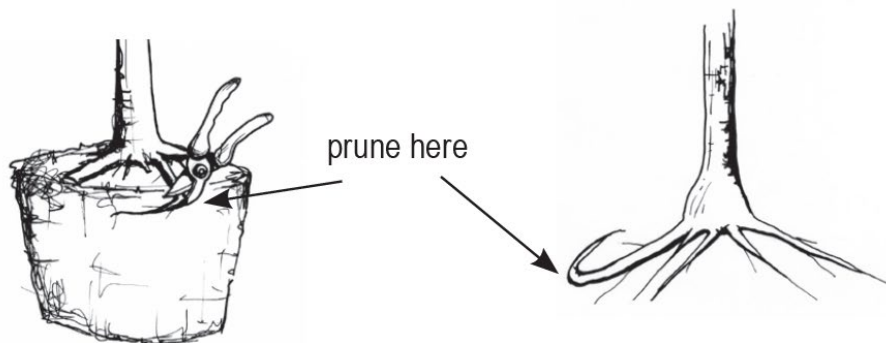
- **Step 3: Prepare Tree for Planting:**

- Locate the tree's trunk flare by removing soil from the top of the container until the highest non-fibrous root is uncovered (Figure 3).



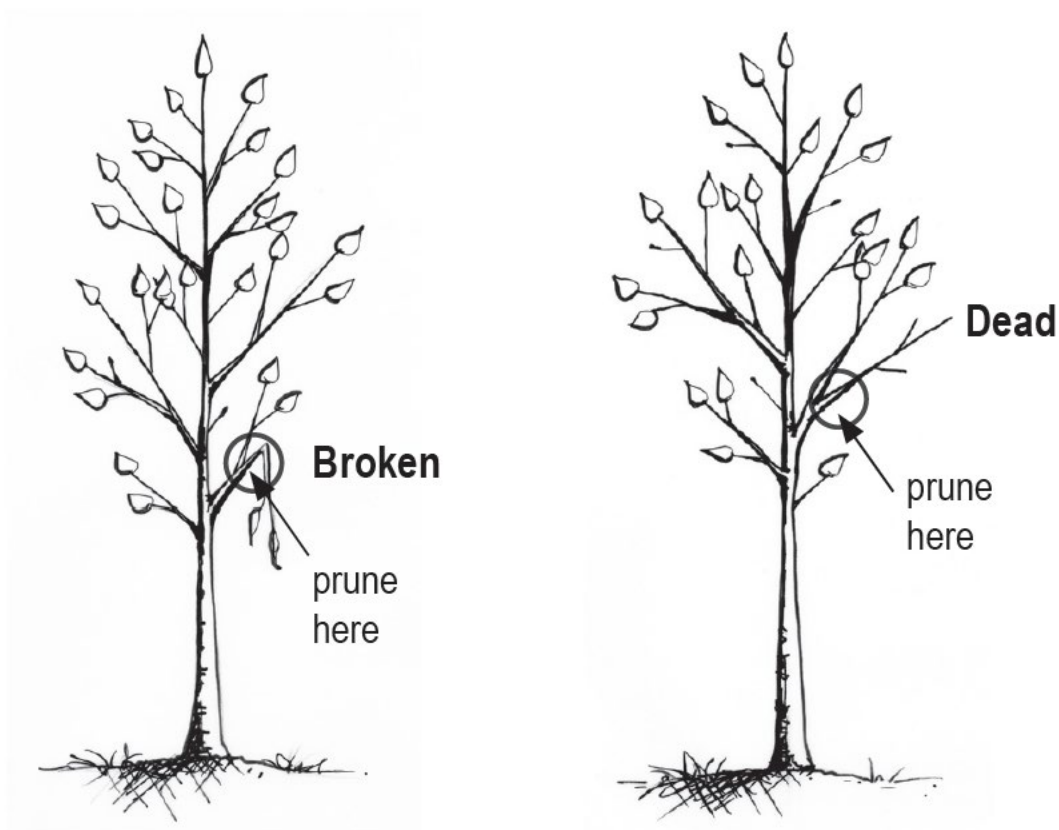
**Figure 15:** Remove the entire container. Pull or cut the soil off the top of the root ball until the main root system is found. A saw works well to remove the top layer of soil. Be careful not to cut into the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Remove the tree from the container by cutting the vertical sides of the container in four places from top to bottom.
- Observe all sides of the root ball for circling or matted roots. Know your container because some containers reduce these occurrences.
- Remove roots circling around the outer part of the root ball using a handsaw to create a box-like cut on the ball. Cut about 5% of the root ball's diameter from four sides (Figure 4).



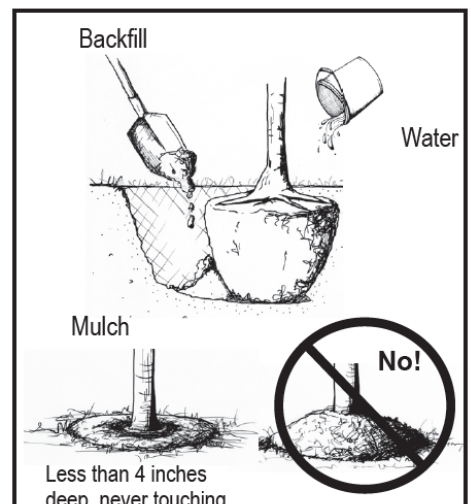
**Figure 16:** Remove all small roots above the main root system with a hand pruner. Examine the main root system for roots that extend out but then turn to the side or back towards the trunk. Prune these roots at the point where they turn. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Remove matted roots from the bottom of the root ball using a handsaw to remove a layer of roots and planting medium. Cut about 5% of the root ball's height from the bottom.
- Inspect the crown, prune any dead or damaged branches, and remove any tags, strings, or tape (Figure 5).



**Figure 17:** Prune only branches that are broken or dead. Minimize pruning at the time of planting. Trees need as many leaves as possible to recover from transplant shock (leaves produce the tree's food). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- **Step 4: Place Tree in Hole:**
  - Place the tree in the center of the hole.
  - Remove soil from top of root ball and cut away circling roots around the trunk flare, fibrous roots above it, or roots that cannot be straightened.
  - Use the shovel's handle to check that the bottom of the trunk flare is at or just above soil grade.
  - Add or remove soil to the hole to align the bottom of the trunk flare with soil grade.
  - Look from all sides of the tree at the straightness of the tree in the hole and adjust the lean so the top of the tree is standing straight and up, not to one side.



**Figure 18:** Make sure the trunk is straight. Put the original soil back in the hole, breaking up large clods, and working it in with your hands or a shovel. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Add backfill soil to the hole to secure the tree in place and remove the shovel from the top of the hole (Figure 6).
- Step 5: Fill Hole and Make Berm
  - Do not add soil amendments such as peat or bark. Do not use fertilizer, potting soil, or chemicals on your new trees.
  - Biochar can be used to amend backfill soil during tree planting, following the label instructions.
  - About 6 inches at a time, add the remaining backfill soil around the root ball in layers, lightly but firmly tamp each layer. If the soil is dry, apply water after each layer is tamped.
  - Build a berm 3 inches high and wide with the remaining soil, circling the inside edge of where grass was removed.
- Step 6: Optional Tree Protection:
  - Due to the potential size of these trees, rabbits and deer may pose a threat to the survivability of newly installed trees.
    - Make a 4-inch wide and 32-inch tall wire cage to place around the tree.
    - Just before backfilling the planting hole, place the cage in the hole with the tree.
    - Plastic tree guards are also effective.
  - To discourage browsing of stem cambium by voles or mice or browsing of twigs and buds by rabbits or deer, apply a repellent following labeled directions.
  - Depending on the locality of the planting site, such as proximity to woodlands or a body of water, deer and beavers can pose a real threat to the survivability of newly installed trees.
    - Install loose-fitting 48-inch tall and minimum 4-inch diameter tree guards, made of wire or plastic mesh, around the tree trunk.
  - Consider staking if the site is windy, vandalism is a concern, or the root ball shifts in the hole after planting:
    - Stake the tree with two wooden stakes placed on opposite sides of the tree.
    - Attach nylon or fabric ties to the stakes and around the tree above the first branch.
    - Tie loops around the tree trunk should be made loose, approximately 3x the trunk diameter.
    - Ties from the tree to the stakes should be left with a slight sag to allow for slight tree and trunk movement.
- Step 7: Water at Installation:
  - Using low water pressure from a hose or bucket, apply water around the hole until the surrounding soil is thoroughly moist immediately following installation.
- Step 8: Mulch the Planting Hole:
  - Mulch materials may be natural wood chips or shredded bark, needles, or leaves free of any extraneous material such as soil, stones, and debris.
  - Apply mulch 2-4 inches deep over the filled hole and berm, leaving 3 inches around the trunk clear from mulch.

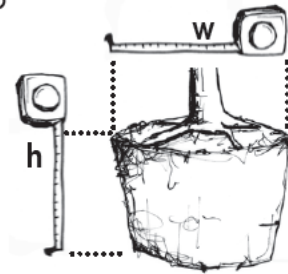
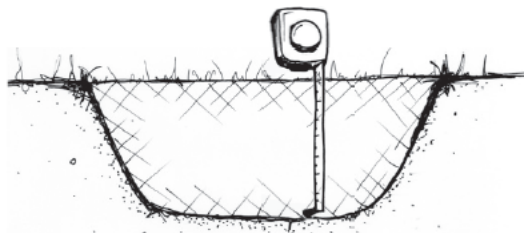


## Planting Balled and Burlapped Trees

Planting balled and burlapped trees requires meticulous care from reception to installation. These steps ensure successful tree establishment and long-term growth.

- Step 1: Receiving Tree for Planting (at tree storage area):
  - Upon delivery, keep trees in a cool, shaded place.
  - If storing overnight, soak the top and sides of the burlap with water.
  - To avoid moisture loss, do not leave trees in direct sunlight for more than 4 hours.
- Step 2: Prepare Hole (at tree planting location):
  - Measure the width and height of the root ball (Figure 1).
  - Remove grass within a circular area a minimum of 1.5 times as wide as the root ball.
  - Dig the hole to the depth of the height of the root ball (Figure 2).
  - In clay soils, use a shovel to loosen the glazed walls of the planting hole.

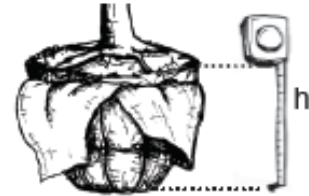
HOLE DEPTH = height of root ball (h)  
HOLE WIDTH = width of root ball (w) × 2 or 3



**Figure 20:** Dig the hole. The dimensions of the hole are very important in determining the survival of your tree. Dig the hole *ONLY* as deep as the root system (NO deeper!). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

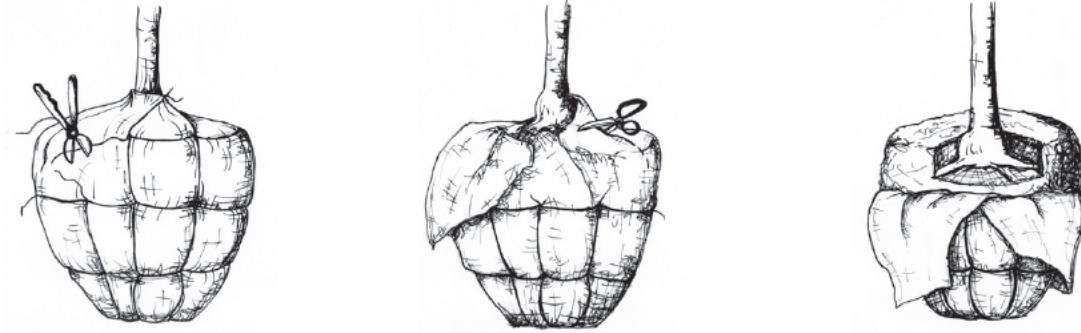
- Step 3: Prepare Tree for Planting:
  - Lay the tree on its side to:
    - Inspect the crown, prune any dead or damaged branches, and remove any tags, strings, or tape.
    - Remove the bottom side of the wire basket by cutting the vertical wires just below the lowest horizontal wires.

### Balled and burlapped (excess soil removed)



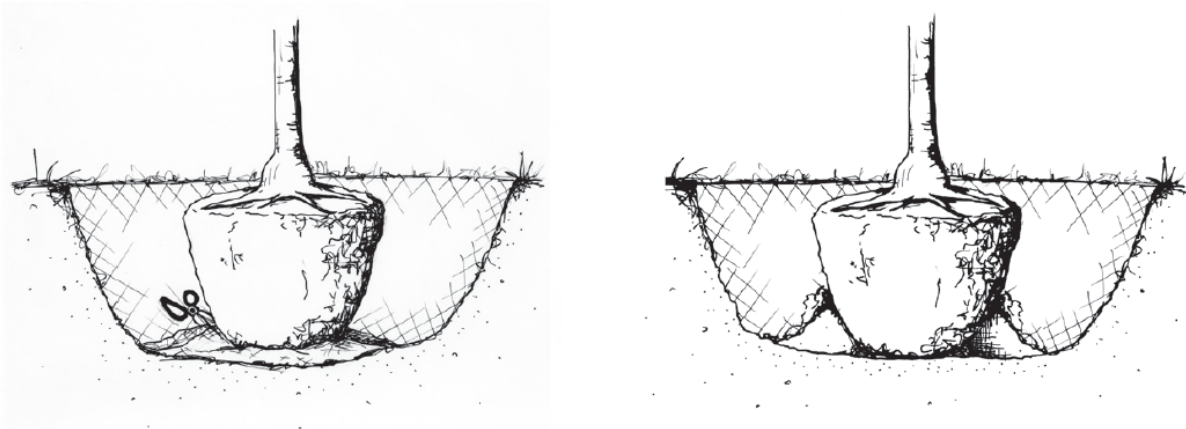
**Figure 19:** Measure the spread and height of the root ball. This is exactly how deep you should dig the hole. Measure the approximate width of the root ball or root system. Multiply this by 2, or if your soil is hard (clay or compacted), by at least 3. This is how wide you should dig the hole. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Stand the tree upright to:
  - Remove ties and nails/staples and pull back the burlap from the top of the root ball.
  - Locate the tree's trunk flare by removing soil from the top of the root ball until the highest non-fibrous root is uncovered (Figure 3).



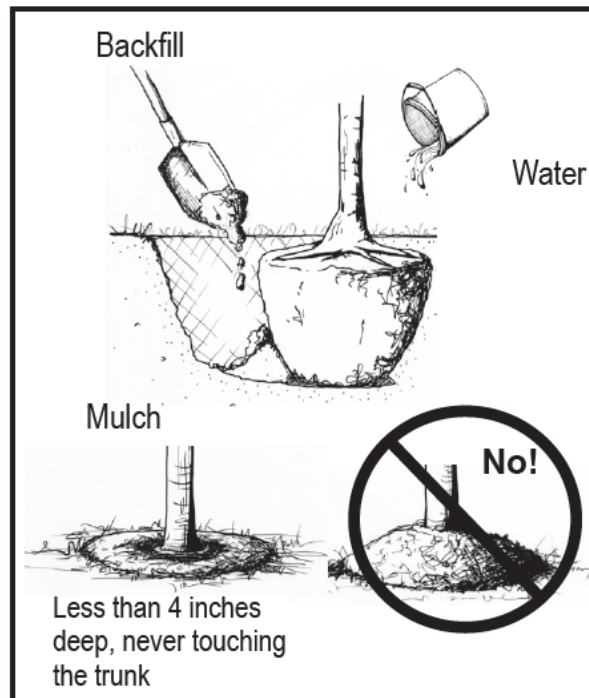
**Figure 21:** Remove the top of the root ball packaging. Cut any twine from around the trunk taking care not to nick the bark. Then bend the wire basket back off the top of the ball. Remove soil from the top of the root ball until the main root system is found. You may have to cut some of the wire. Leave the rest of the wire basket in place until the tree is put in the ground. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Step 4: Placing the Tree:
  - Measure the height of the root ball from the base to the located root flare.
  - Place a shovel handle across the top of the hole and measure the depth of the hole.
  - Add or remove soil to the hole to align the measurement so that the trunk flare is at or slightly above soil grade.
  - Place the tree in the center of the hole, maneuvering the tree by the root ball, avoiding pulling or pushing the stem of the tree (Figure 4).
  - Confirm that the trunk flare is at or slightly above soil grade and if not, add or remove soil from the base of the hole, maneuvering the tree by the root ball.
  - Look from all sides of the tree at the straightness of the tree in the hole and adjust the lean so the top of the tree is standing straight and up, not to one side.
  - Secure the tree in place by adding just enough backfill soil to the hole (about 1/3 full).
  - Cut away the remaining wire basket and as much of the burlap as possible without disturbing the tree's alignment.
  - Cut away circling roots around the trunk flare, fibrous roots above it, or roots that cannot be straightened.



**Figure 22:** Without loosening the root ball, cut, peel back, and remove as much of the wire basket and burlap as possible (at least the top third). A root ball should remain a root ball. If it starts to fall apart as you take off the wire and burlap, backfill the hole with enough soil to stabilize it. Then carefully remove the wire and burlap and backfill as you go to keep the root ball intact. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- **Step 5: Fill Hole and Make Berm:**
  - Do not add soil amendments such as peat or bark. Do not use fertilizer, potting soil, or chemicals on your new trees.
  - Biochar can be used to amend backfill soil during tree planting, following the label instructions.
  - About 6 inches at a time, add the remaining backfill soil around the root ball in layers, lightly but firmly tamp each layer. If the soil is dry, apply water after each layer is tamped (Figure 5).
  - Build a berm 3 inches high and wide with the remaining soil, circling the inside edge of where grass was removed.
- **Step 6: Optional Tree Protection:**
  - To discourage browsing of stem cambium by voles or mice or browsing of twigs and buds by deer, apply a repellent following labeled directions.



**Figure 23:** Make sure the trunk is straight. Put the original soil back in the hole, breaking up large clods, and working it in with your hands or a shovel. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

- Depending on the locality of the planting site, such as proximity to woodlands or a body of water, deer and beavers can pose a real threat to the survivability of newly installed trees.
  - Install loose-fitting 48-inch tall and minimum 4-inch diameter tree guards, made of wire or plastic mesh, around the tree trunk.
- Consider staking if the site is windy, vandalism is a concern, or the root ball shifts in the hole after planting:
  - Stake the tree with two wooden stakes placed on opposite sides of the tree.
  - Attach nylon or fabric ties to the stakes and around the tree above the first branch.
  - Tie loops around the tree trunk should be made loose, approximately 3x the trunk diameter.
  - Ties from the tree to the stakes should be left with a slight sag to allow for slight tree and trunk movement.
- Step 7: Water at Installation:
  - Using low water pressure from a hose or bucket, apply water around the hole until the surrounding soil is thoroughly moist immediately following installation.
- Step 8: Mulch the Planting Hole:
  - Mulch materials may be natural wood chips or shredded bark, needles, or leaves free of any extraneous material such as soil, stones, and debris.
  - Apply mulch 2-4 inches deep over the filled hole and berm, leaving 3 inches around the trunk clear from mulch (Figure 6).



**Figure 24:** There should never be more than 4 inches of mulch over the roots. Too much mulch or soil can prevent oxygen from reaching the roots. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

# APPENDIX III: TREE MAINTENANCE GUIDES

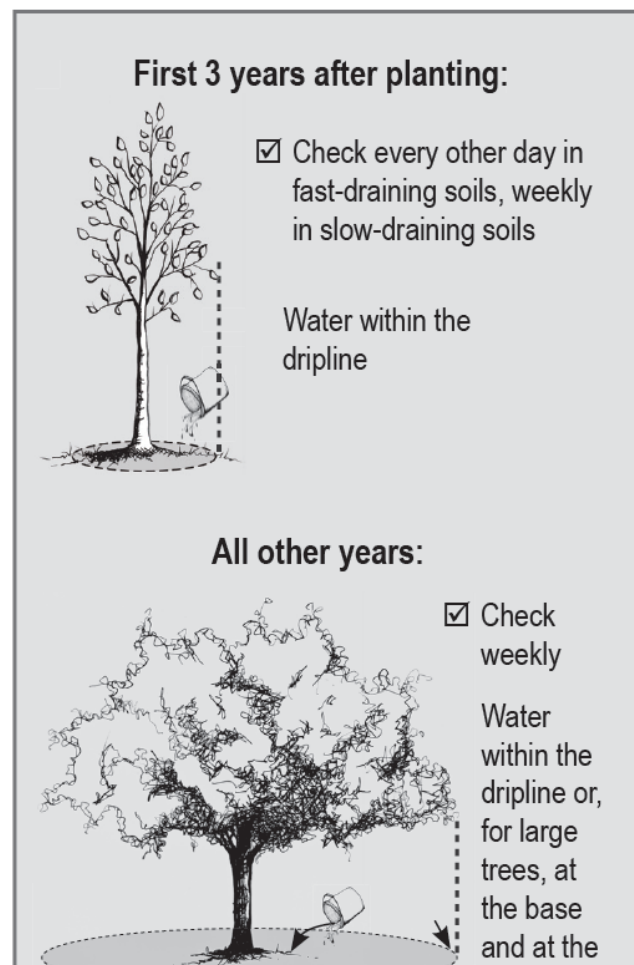
## Tree Maintenance for Natural Areas

Trees in natural areas are crucial components of local ecosystems, making their preservation and care a wise investment for conservation efforts. Thriving natural areas enhance biodiversity, support wildlife habitats, contribute to scenic beauty, mitigate stormwater runoff, improve air quality, and provide essential ecosystem services. Regular maintenance of new and established trees ensures the resilience and ecological integrity of natural areas for future generations to enjoy and benefit from.

### New Tree Maintenance

**Irrigation:** Trees require consistent, thorough watering for at least three years post-planting (Figure 1).

- Any newly planted trees that don't experience the equivalent of 1 inch of rainfall a week should be placed on a watering schedule.
- Know the soil texture at the planting location to understand its water-holding capacity.
- Establish a soil moisture monitoring protocol to ensure adequate water levels throughout the year.
  - Watering season for most trees mimics the growing season, approximately May 1 through October 31.
  - Deciduous trees need no supplemental water when leaves are not on trees, approximately November 1 through April 30.
  - Conifers and broadleaf evergreens should receive supplemental water throughout the fall and winter, approximately November 1 through April 30.
- Newly planted trees should receive a minimum of 1 inch of water per inch of caliper per week.



**Figure 25:** First 3 years after planting: If the soil is dry, provide about 1-1/2 gallons of water per diameter inch of the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

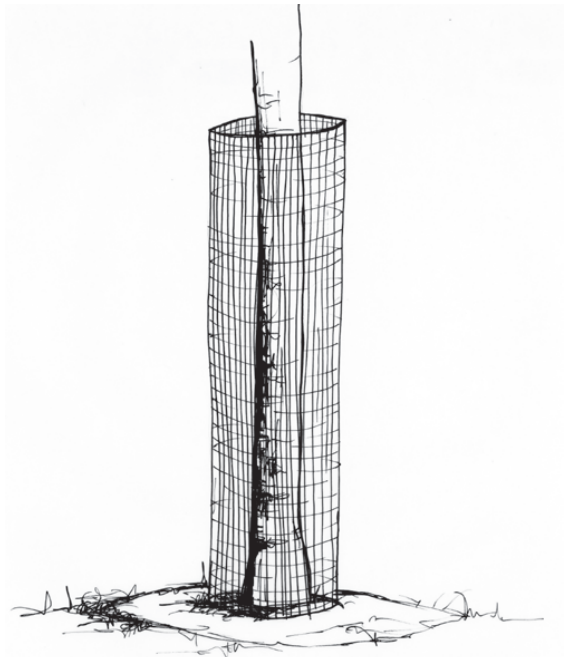
- To offset the lack of water provided by rain or the water table at the site, newly planted trees should receive a minimum of 5 gallons of water per caliper inch at each watering.
- Several methods of irrigation can effectively water trees in natural areas, including hand-watering, irrigation bags, or bucket drip irrigation.
- Tall-sided irrigation bags should be used only when trees are a minimum of 1.25 inches in caliper, with branching starting above 3 feet.

Planting Circle Maintenance: Reduced environmental stresses, such as temperature extremes or weed competition, positively impact tree health.

- Keep the initial planting circle clear of vegetation and other debris by removing it by hand or cutting it with a string trimmer, careful not to strike the tree trunk.
- If mulch maintenance is attainable or desired, use natural wood chips or shredded bark, needles, or leaves free of any extraneous material such as soil, stones, and debris.
- Replenish mulch as needed to maintain a 2- to 3-inch-deep layer around the tree, leaving 3 inches around the trunk clear from mulch.
- Do not use weed killer near small or thin-barked trees.

### Tree Protection

- Rabbits and deer may browse on trees shorter than 3 feet tall.
- Make a 4-inch wide and 32-inch tall wire cage to place around the tree (Figure 2).
- Secure the cage to the ground with a stake.
- Plastic tree guards are also effective.
- Voles, mice, and rabbits may damage stem cambium using wood to trim teeth.
- Apply a repellent following labeled directions.
- Deer may damage stem cambium using the stem as an antler rub, and beavers may damage stem cambium using wood to trim teeth or cut for use in dams.
- Install loose-fitting 48-inch tall and minimum 4-inch diameter tree guards, made of wire or plastic mesh, around the tree trunk.
- All wildlife tree protection should be monitored seasonally and adjusted or removed as needed.
- Stakes installed at the tree's planting are typically removed after 1 year or one full growing season when they are capable of supporting themselves.



**Figure 26:** To prevent long-term damage associated with trunk wounding, install protection around the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

### Tree Health

- The majority of all pruning should happen during leaf-off conditions and by a licensed arborist in accordance with ANSI A300 *Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance*.
- Large-growing trees should be pruned to maintain a central leader to 20 feet.
- Lateral branching should be retained to deter deer from using the stem as an antler rub.

## Established Tree Maintenance

Monitor Tree Health: When conducting inspections of trees in natural areas, it's crucial to be vigilant for any abnormalities related to the survivability of the tree such as:

- *Presence of Pests or Pathogens*: Inspect for signs of pest infestations such as insect activity, chew marks, or the presence of larvae. Additionally, check for symptoms of diseases such as unusual lesions, discoloration, or wilting foliage.
- *Abnormal Leaf Characteristics*: Look for abnormalities in leaf size, shape, color, or texture. This can include premature leaf drop, yellowing or browning of leaves, or unusual spotting or discoloration.
- *Structural Integrity*: Assess the overall structure of the tree, including the integrity of major branches and the main trunk. Pay attention to any signs of weakness, such as cracks or splits, that could indicate a risk of failure particularly when a person could be injured or property could be damaged by a falling tree part or whole tree.

If any abnormalities are detected during the inspection, it's important to document them thoroughly and monitor them closely over time. Additionally, it's advisable to report these findings to a local tree care professional or certified arborist for further evaluation and advice on appropriate treatment options. Depending on the specific issues identified, treatment options may include pruning, pest or disease management, soil amendments, or other corrective measures aimed at preserving the health and safety of the tree.

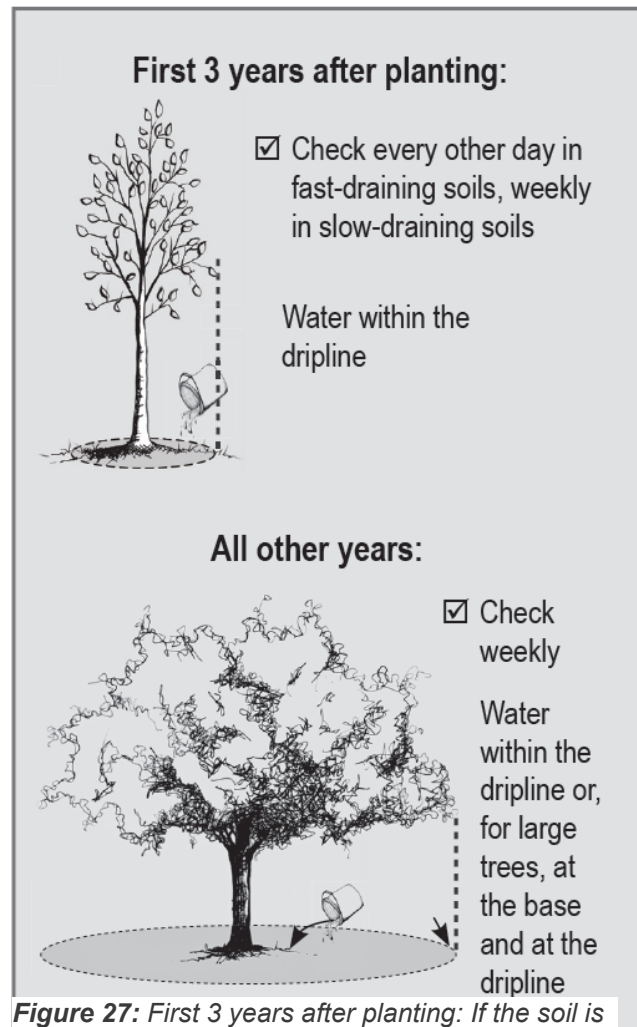
## Tree Maintenance for Landscaped Areas

Trees are essential in local communities, making tree care a wise investment for tree owners. Healthy trees increase property values, provide for wildlife, beautify surroundings, clean and lessen stormwater runoff, purify air, and save energy by providing shade in summer and protection in winter. Regular maintenance of new and established trees ensures trees remain healthy and structurally sound.

### New Tree Maintenance

**Irrigation** - Trees require consistent, thorough watering for at least three years post-planting.

- Any newly planted trees that don't experience the equivalent of 1 inch of rainfall a week should be placed on a watering schedule.
- Know the soil texture at the planting location to understand its water-holding capacity.
- Establish a soil moisture monitoring protocol to ensure adequate water levels throughout the year.
  - The watering season for most trees mimics the growing season, approximately May 1 through October 31.
  - Deciduous trees need no supplemental water when leaves are not on trees, approximately November 1 through April 30.
  - Conifers and broadleaf evergreens should receive supplemental water throughout the fall and winter, approximately November 1 through April 30.
- Newly planted trees should receive a minimum of 1 inch of water per inch of caliper per week (Figure 1).
  - To offset the lack of water provided by rain or the water table at the site, newly planted trees should receive a minimum of 5 gallons of water per caliper inch at each watering.



**Figure 27:** First 3 years after planting: If the soil is dry, provide about 1-1/2 gallons of water per diameter inch of the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).



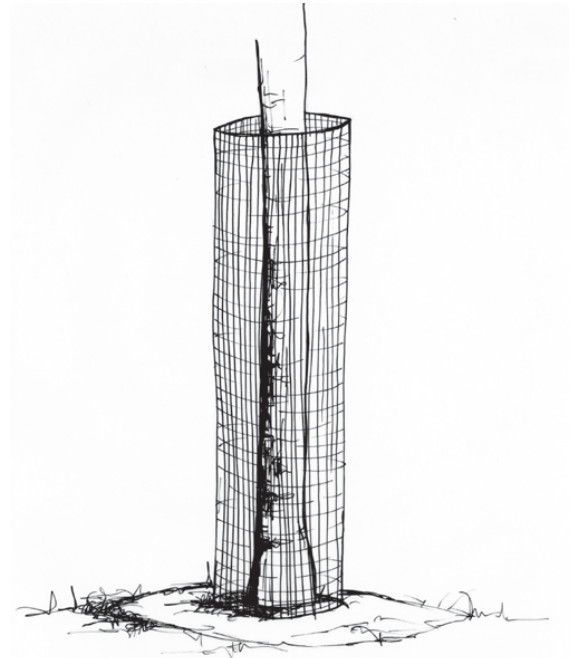
- Several methods of irrigation can effectively water trees in natural areas, including hand-watering, irrigation bags, soaker hoses, or bucket drip irrigation.
- Tall-sided irrigation bags should be used only when trees are a minimum of 1.5 inches in caliper trees with branching starting above 3 feet.

**Planting Circle Maintenance:** Reduced environmental stresses, such as temperature extremes or weed competition, positively impact tree health.

- Keep the initial planting circle clear of vegetation and other debris by removing it by hand or cutting it with a string trimmer, careful not to strike the tree trunk.
- If mulch maintenance is attainable or desired, use natural wood chips or shredded bark, needles, or leaves free of any extraneous material such as soil, stones, and debris.
- Replenish mulch as needed to maintain a 2 to 3-inch deep layer around the tree, leaving 3 inches around the trunk clear from mulch. Do not use weed killer near small or thin-barked trees.

### Tree Protection

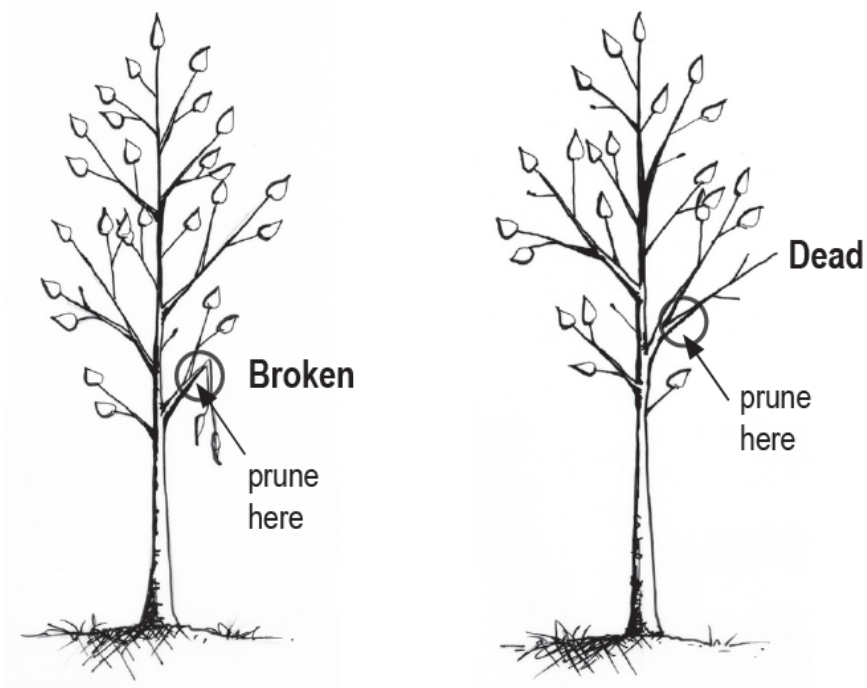
- Rabbits and deer may browse on trees shorter than 3 feet tall.
  - Make a 4-inch wide and 32-inch tall wire cage to place around the tree (Figure 2).
  - Secure the cage to the ground with a stake.
  - Plastic tree guards are also effective.
- Voles, mice, and rabbits may damage stem cambium using wood to trim teeth.
  - Apply a repellent following labeled directions.
- Deer may damage stem cambium using the stem as an antler rub and beavers may damage stem cambium using wood to trim teeth or cut for use in dams.
  - Install loose-fitting 48-inch tall and minimum 4-inch diameter tree guards, made of wire or plastic mesh, around the tree trunk.
- All wildlife tree protection should be monitored seasonally and adjusted or removed as needed.
- Stakes installed at the tree's planting are typically removed after 1 year or one full growing season when they are capable of supporting themselves.



**Figure 28:** To prevent long-term damage associated with trunk wounding, install protection around the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

### Tree Health

- The majority of all pruning should happen during leaf-off conditions and by a licensed arborist in accordance with ANSI A300 *Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance*.
- Large-growing trees should be pruned to maintain a central leader to 20 feet.
- Lateral branching should be retained to deter deer from using the stem as an antler rub.
- After the first growing season, trees may be pruned to remove any dead, diseased, damaged, or dying branches (Figure 3).
- After the third growing season, branches may be removed that are clustered together or are crossing.
- Tools used to prune shall be sharp and cleaned thoroughly with alcohol, hydrogen peroxide, or chlorine bleach before pruning.
- Treatment of cuts with wound dressing or paints should not be used.



**Figure 29:** Prune only branches that are broken or dead. You may also remove competing leaders if present. Most trees should have one central leader. If there are two or more leaders, choose which one you want to remain and remove the other(s). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

## Established Tree Maintenance

**Monitor Tree Health:** When conducting routine checks of trees in an orchard, it's essential to diligently observe for any signs of distress or irregularities such as:

- **Visible Signs of Decay or Damage:** Look for areas of decay, cracks, splits, or wounds on the trunk, branches, or bark. These can indicate underlying issues such as fungal infections, pest infestations, or structural weaknesses.
- **Unusual Growth Patterns:** Keep an eye out for abnormal growth patterns such as excessive leaning, sudden changes in canopy density, or the presence of epicormic shoots (new growth from dormant buds on branches or trunks). These can signal stress or underlying health issues.
- **Presence of Pests or Pathogens:** Inspect for signs of pest infestations such as insect activity, chew marks, or the presence of larvae. Additionally, check for symptoms of diseases such as unusual lesions, discoloration, or wilting foliage.
- **Root Zone Issues:** Examine the area around the base of the tree for signs of root damage, soil compaction, or root girdling (roots circling the trunk). These issues can affect the tree's stability and nutrient uptake (Figure 4).
- **Abnormal Leaf Characteristics:** Look for abnormalities in leaf size, shape, color, or texture. This can include premature leaf drop, yellowing or browning of leaves, or unusual spotting or discoloration.
- **Structural Integrity:** Assess the overall structure of the tree, including the integrity of major branches and the main trunk. Pay attention to any signs of weakness, such as cracks or splits, that could indicate a risk of failure.



Root likely to become a problem (when trunk and root meet)



Problem root already touching the trunk

**Figure 30:** Roots that encircle the trunk will likely cause health or safety problems later. Make sure that soil or mulch is never piled against the root collar. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

If any abnormalities are detected during the inspection, it's important to document them thoroughly and monitor them closely over time. Additionally, it's advisable to report these findings to a local tree care professional or certified arborist for further evaluation and advice on appropriate treatment options. Depending on the specific issues identified, treatment options may include pruning, pest or disease management, soil amendments, or other corrective measures aimed at preserving the health and safety of the tree.

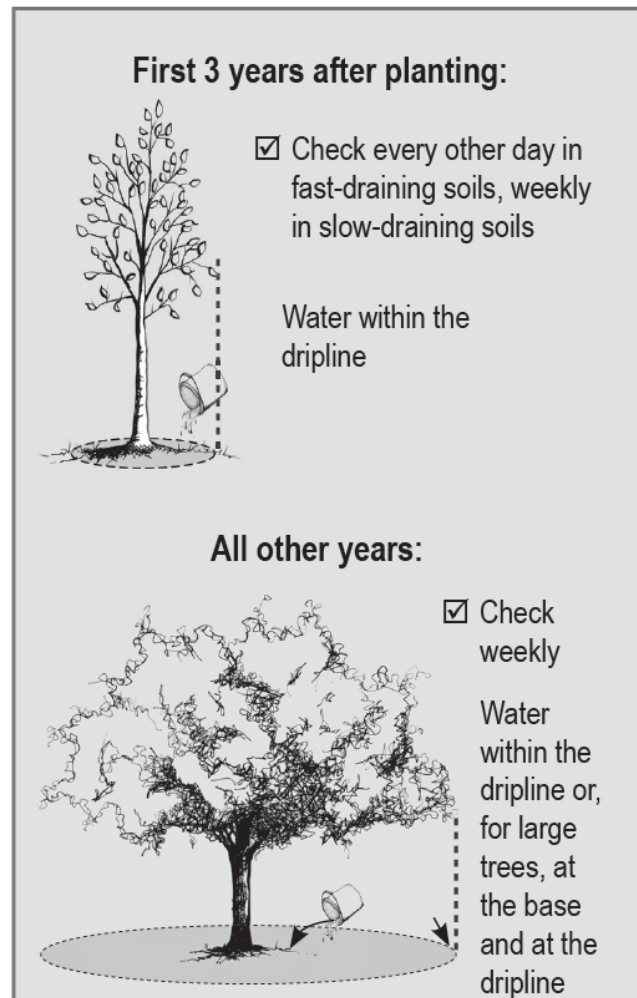
## Tree Maintenance for Municipal Orchards

In urban landscapes, municipal tree orchards serve as vital green assets, contributing to environmental health while also bridging food insecurity in underserved areas. Municipalities can play a crucial role in creating these orchards and ensuring their longevity and benefits to marginalized communities. Regular maintenance of new and established fruit trees ensures trees remain healthy and produce fruit.

### New Tree Maintenance

**Irrigation:** Trees require consistent, thorough watering for at least three years post planting.

- Any newly planted trees that don't experience the equivalent of 1-inch of rainfall a week should be placed on a watering schedule.
- Know the soil texture at the planting location to understand its water-holding capacity.
- Establish a soil moisture monitoring protocol to ensure adequate water levels throughout the year (Figure 1).
  - Watering season for most trees mimics the growing season, approximately May 1 through to Oct 31.
  - Deciduous trees need no supplemental water when leaves are not on trees, approximately November 1 through to April 30.
  - Conifers and broadleaf evergreens should receive supplemental water throughout the fall and winter, approximately November 1 through to April 30.
- Newly planted trees should receive a minimum of 1 inch of water per inch of caliper per week.
  - To offset lack of water provided by rain or the water table at the site, newly planted trees should receive a minimum of 5 gallons of water per caliper inch at each watering.



**Figure 31:** First 3 years after planting: If the soil is dry, provide about 1-1/2 gallons of water per diameter inch of the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

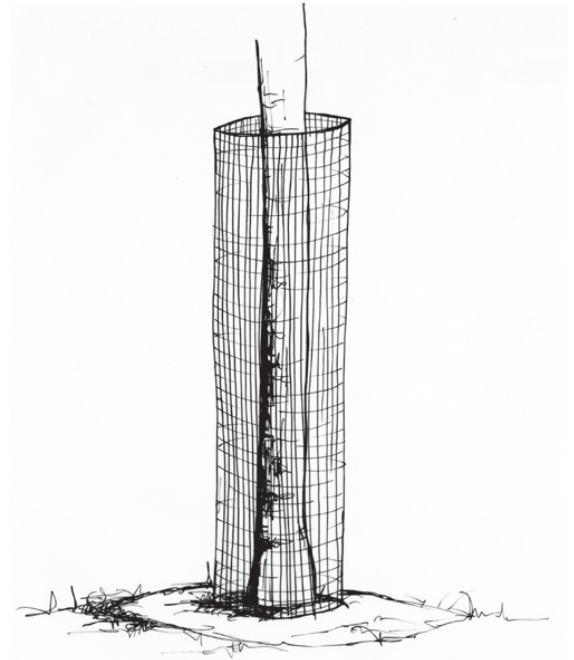
- Several methods of irrigation can effectively water trees in natural areas, including hand-watering, irrigation bags, soaker hose, or bucket drip irrigation.
- Tall-sided irrigation bags should be used only when trees are a minimum 1.5 inches in caliper trees with branching starting above 3 feet.

**Planting Circle Maintenance:** Reduced environmental stresses, such as temperature extremes or weed competition, positively impacts tree health.

- Keep the initial planting circle clear of vegetation and other debris by removing it by hand or cutting it with a string trimmer, careful not to strike the tree trunk.
- If mulch maintenance is attainable or desired, use natural wood chips or shredded bark, needles, or leaves free of any extraneous material such as soil, stones, and debris.
- Replenished mulch as needed to maintain a 2 to 3-inch deep layer around the tree, leaving 3 inches around the trunk clear from mulch.
- Do not use weed killer near small or thin barked trees.

### Tree Protection

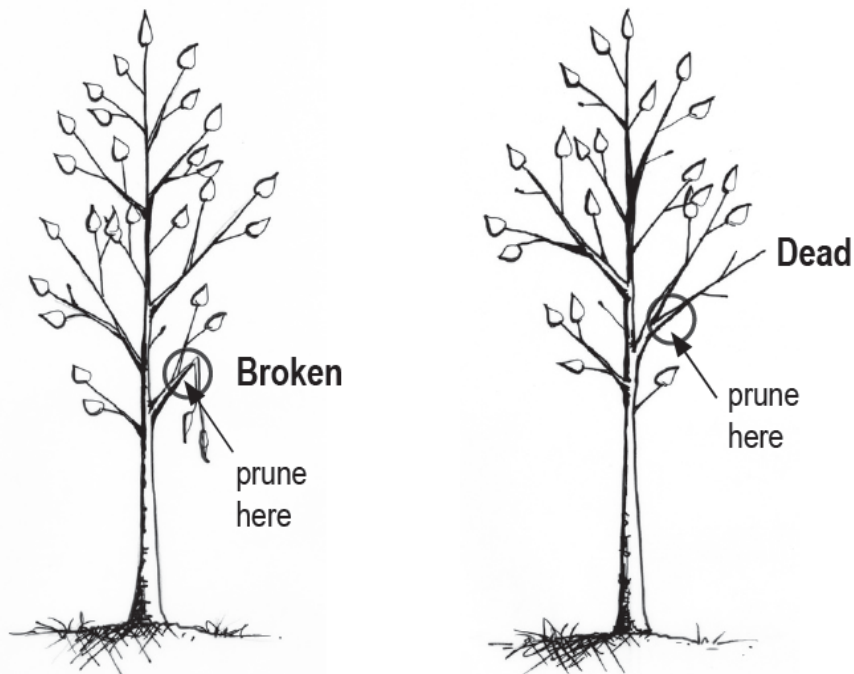
- Rabbits and deer may browse on trees shorter than 3 feet tall.
  - Make a 4-inch wide and 32-inch tall wire cage to place around the tree (Figure 2).
  - Secure the cage to the ground with a stake.
  - Plastic tree guards are also effective.
- Voles, mice, and rabbits may damage stem cambium using wood to trim teeth.
  - Apply a repellent following labeled directions.
- Deer may damage stem cambium using the stem as an antler rub and beavers may damage stem cambium using wood to trim teeth or cut for use in dams.
  - Install loose-fitting 48-inch tall and minimum 4-inch diameter tree guards, made of wire or plastic mesh, around the tree trunk.
- All wildlife tree protection should be monitored seasonally and adjusted or removed as needed.
- Stakes installed at the tree's planting are typically removed after 1-year or one full growing season when they are capable of supporting themselves.



**Figure 32:** To prevent long-term damage associated with trunk wounding, install protection around the trunk. Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

## Tree Health

- The majority of all pruning should happen during leaf off conditions and by a licensed arborist in accordance with ANSI A300 *Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance*.
- Lateral branching should be retained to deter deer from using the stem as an antler rub.
- After the first growing season, trees may be pruned to remove any dead, diseased, damaged, or dying branches (Figure 3).
- After the third growing season, trees may begin producing fruit.
  - Prune to encourage outward growth and maintain an open canopy structure to optimize sunlight penetration and air circulation. Thin out excessive or congested growth to reduce shading and improve fruit quality and ripening.
  - Consider the fruiting habit of the tree species when pruning, such as spur-bearing or tip-bearing, to promote consistent fruit production.
  - Be mindful of keeping appropriate-age wood for specific species: apples, pears, cherries and plums generally tend to produce the best crop on wood that is 2-3 years of age, while peaches typically produce best on 1-year-old wood.
- Tools used to prune shall be sharp and cleaned thoroughly with alcohol, hydrogen peroxide, or chlorine bleach before pruning. It is advisable to clean tools after each cut to limit the spread of pathogens from cut to cut and tree to tree.
- Treatment of cuts with wound dressing or paints should not be used.



**Figure 33:** Prune only branches that are broken or dead. You may also remove competing leaders if present. Most trees should have one central leader. If there are two or more leaders, choose which one you want to remain and remove the other(s). Source: US Forest Service Tree Owner's Manual. [www.treeownersmanual.info](http://www.treeownersmanual.info).

## Established Tree Maintenance

Caring for trees in orchards involves a combination of regular maintenance tasks and attentive monitoring to ensure their health and productivity. Here are some essential steps for caring for trees in an orchard:

- *Monitoring and Record-Keeping:* Regularly inspect trees for signs of stress, disease, or pest damage, and keep detailed records of observations and management activities. This information can help identify trends and guide future orchard management decisions.
- *Pruning:* Regular pruning is crucial for maintaining tree health and promoting optimal fruit production. Prune to remove dead, diseased, or damaged branches, as well as any branches that are crossing or rubbing against each other. Proper pruning also helps shape the tree and improve air circulation within the canopy.
- *Watering:* Provide adequate water to the trees, especially during dry periods or when the trees are young and establishing their root systems. Water deeply and evenly, making sure the soil around the roots stays consistently moist but not waterlogged.
- *Fertilizing:* Apply appropriate fertilizers to supply essential nutrients to the trees. Conduct soil tests to determine the specific nutrient needs of the orchard, and then apply fertilizers accordingly. Typically, fertilization is done in early spring before bud break and again in late spring or early summer.
- *Pest and Disease Management:* Monitor trees regularly for signs of pests, diseases, and nutrient deficiencies. Implement integrated pest management (IPM) strategies to manage pest populations, which may include cultural practices, biological controls, and, if necessary, targeted pesticide applications. Prune out and dispose of any diseased or infested branches to prevent the spread of pathogens.
- *Weed Control:* Keep the area around the base of the trees free of weeds and competing vegetation, which can compete with the trees for water and nutrients. Use mulch to help suppress weed growth and conserve soil moisture.
- *Thinning Fruit:* Thin excess fruit from the trees to promote larger, higher-quality fruits and reduce the risk of branch breakage from the weight of heavy fruit loads. Thinning also helps prevent biennial bearing, where trees produce a heavy crop one year and a light crop the next.
- *Protecting Against Extreme Weather:* Take measures to protect trees from extreme weather conditions, such as frost protection during cold spells and providing shade or supplemental irrigation during heatwaves.

By implementing these practices and remaining attentive to the trees' needs, municipal orchards can effectively sustain healthy and fruitful trees, fulfilling a need within the local community.

## APPENDIX IV: SELF-GUIDED ASSESSMENT OF FORESTRY PRACTICES

Setting goals is an important step toward ensuring that forestry programs are implemented in a deliberate manner and are focused on achieving the identified goals. The goal-setting exercise might focus on implementation goals, such as planting a certain number of trees; or environmental and quality-of-life goals (e.g., decreasing flood events in residential areas, reducing temperatures by providing shade along streets). Some agencies or departments might embark on a more focused, near-term goal-setting exercise that identifies the implementation of specific programs to support broader forestry goals, such as establishing a Relative Performance Index to understand the age, health, and condition of publicly owned trees, by species.

USFS, [American Forests](#), and the [National Association of Regional Councils](#) have developed a free, online [Community Assessment and Goal-Setting Tool](#) to help decision makers and practitioners assess their department's or agency's current forestry program and set achievable goals to align those programs with best practices. This tool can be used to effectively prepare a community for Tree City USA recognition.

In addition to the resources mentioned above, Delta Institute has developed the following assessment framework for department or agency personnel to assess the goals, outcomes, and existing practices of a forestry program. This self-assessment allows personnel to make decisions about how best to align current and future programs with the best practices described above.

### Community Goals

Identifying community goals is essential for creating an urban forestry management plan that is responsive to local needs, values, and aspirations. By engaging residents in the goal-setting process, planners can develop strategies that are relevant, effective, and sustainable, ultimately leading to healthier and more vibrant communities.

Goal	Briefly describe the goals that your department or agency have set for forestry-related activities.
1	
2	
3	



## Targeted Outcomes

Identifying targeted outcomes helps communities create a more focused, measurable, and adaptive urban forestry management plan that can effectively meet the needs of both the community and the environment.

Targeted Outcome	Briefly describe the desired outcomes that will result from reaching the goals described above.
1	
2	
3	

Targeted Outcome	How well do the outcomes align with your goals?
1	
2	
3	

Targeted Outcome	Are the targeted outcomes quantifiable or qualitative? If so, how? See Table 4, below, for potential outcome metrics.
1	
2	
3	

**Table 4: Potential Forestry Outcomes**

<b>Quantitative Outcomes Table</b>	<p><b>Investments</b></p> <ul style="list-style-type: none"> <li>• Total local public dollars invested.</li> <li>• Total local public dollars leveraged.</li> <li>• Total federal public dollars leveraged.</li> <li>• Total private dollars leveraged</li> </ul>
	<p><b>Green Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Number of trees planted.</li> <li>• Number of trees maintained.</li> <li>• Number of species planted or maintained.</li> <li>• Square feet on new canopy added</li> </ul>
	<p><b>Reduced Environmental Impact</b></p> <ul style="list-style-type: none"> <li>• Estimated net reduction in surface temperature.</li> <li>• Gallons of runoff treated or captured.</li> <li>• Net tons of CO2 emissions sequestered</li> </ul>
	<p><b>Community Benefits</b></p> <ul style="list-style-type: none"> <li>• Total jobs created.</li> <li>• Total jobs maintained.</li> <li>• Total volunteers engaged.</li> <li>• Total neighborhoods served</li> </ul>
<b>Qualitative Outcomes Table</b>	<p><b>Government Initiatives</b></p> <ul style="list-style-type: none"> <li>• Tree board created or maintained.</li> <li>• Plans or inventories created.</li> <li>• Ordinances created.</li> <li>• Initiatives or programs created.</li> <li>• Initiatives or programs supported.</li> </ul>

**Existing Programs and Initiatives**

Identifying existing programs and initiatives provides communities with valuable insights, resources, and opportunities to enhance the effectiveness, efficiency, and sustainability of their urban forestry management efforts. By building on what already exists, communities can create stronger, more integrated, and more impactful management plans that benefit both residents and the urban environment.

Briefly describe the departments, governing boards, or agencies that oversee and/or implement forestry-related activities.	Should additional groups/individuals be involved?	If so, which ones? Describe their role.

Briefly describe any ordinances or guidelines that apply to forestry-related activities conducted by your department or agency.	How do these policies and regulations support your goals?

Briefly describe any events or additional programming used to engage residents or other community groups around forestry-related activities.	What's worked well?	What lessons can be learned from these activities?

## Funding

Often, community groups and municipalities need a “starting point” to assess their needs prior to submitting forestry-focused grant requests. This is a simple starting point to canvas current forestry funding in your community.

Briefly describe how forestry-related activities are currently funded (dedicated local funding, pass-through grants, etc.).	How much of your department/agency’s funding goes towards tree planting and maintenance?	What are the benefits and drawbacks associated with these sources of funding?

## S.W.O.T. Analysis

This exercise is designed to identify the strengths, weaknesses, threats, and opportunities associated with your department or agency’s ability to conduct forestry-related activities:

	<b>Strengths:</b> Describe what your organization excels at.	<b>Weaknesses:</b> Describe challenges that your organization faces.	<b>Opportunities:</b> Describe favorable factors, external to your agency or department, that can provide an advantage to your organization.	<b>Threats:</b> Describe factors that could potentially harm your agency or department.
Forestry-related				
Non-forestry related				

## Considering Equity and Inclusion in the Forestry Goal Setting & Assessment Process

To incorporate DEI principles into the Forestry Goal Setting & Assessment process, consider the following diagnostic questions:

- What forestry-goals in your community specifically benefit low resource communities?
- Of the targeted qualitative and quantitative outcomes illustrated in Table 4, which can be associated with projects occurring within low to moderately resourced communities?
  - What ordinances, policies, and guidelines exist that advance forestry (and its benefits) in low to moderate resourced communities?
- Is there programming in your community intended to engage low to moderate income residents around forestry-related activities?
- What funding sources (or existing programs) exist in your community that support tree planting and maintenance in low to moderate resourced neighborhoods?
- What are the Strengths, Weaknesses, Opportunities, and Threats that relate to your department or agency's ability to advance forestry-related activities in low to moderate-resourced neighborhoods, in contrast with the wider community?

While aspects of goal setting and self-assessment are broader than the topic of diversity, equity, and inclusion, incorporating a DEI lens helps to provide a municipality or agency with an understanding of whether their forestry-related activities successfully address environmental health or quality of life concerns in underserved areas.

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